AL.2.1993-102
c.2

[redacted]

BARRIER-FREE
DESIGN GUIDE

[redacted]

Alberta
LABOUR
Client Services Division
Technical Services

705, 10808 – 99 Avenue
Edmonton, Alberta
Canada T5K 0G5

Telephone 403/427-8265
Fax 403/422-3562

CANADIANA

MAR - 2 1993

BARRIER-FREE DESIGN GUIDE

Alberta
LABOUR
Client Services Division
Technical Services

705, 10808 – 99 Avenue
Edmonton, Alberta
Canada T5K 0G5

Telephone 403/427-8265
Fax 403/422-3562

Digitized by the Internet Archive
in 2015

https://archive.org/details/barrierfreedesig00albe

TABLE OF CONTENTS

Preface 2
Acknowledgements 3
Definitions 4

I. General Design Considerations

- Where do Barrier-Free Requirements Apply? 7
- Special Considerations and Exemptions 8
- Special Requirements for Residential Projects 9
- Accessible Entrances 9
- Barrier-Free Path of Travel 11
- Occupancy Requirements 12
- Fire Safety Measures 14

II. Site Development

- Access to and from Parking 16
- Parking 16
- Passenger Loading Zones 17
- Curbs 18
- Exterior Walks and Ramps 19
- Ramps 20

III. Circulation

- Doorways 23
- Corridors 26
- Overhead Hazard 27
- Stairs, Handrails and Guards 27
- Elevators 32
- Passenger Elevating Devices 37

IV. Public Facilities

- When are Washrooms required to be Barrier-Free? 38
- Self Contained Washrooms 40
- Water Closet Stalls 42
- Water Closets and Urinals 45
- Lavatories 46
- Washroom Accessories 47
- Shower Stalls 47
- Counters 49
- Drinking Fountains 50
- Seating at Performances and Sports Events 50
- Location of Controls 52

V. Communication

- Fire Alarms 53
- Entrance Security 54
- Tactile Warning Signals 55
- Public Telephones 56
- Assistive Listening Devices 57
- Signage 58
- Floor Numbering 63

VI. General Information and Residential Requirements

- Wheelchairs 64
- Reaching Abilities from Wheelchairs 65
- Person Using a Cane or Crutches 66
- Residential Design 67
- Entrances 67
- Doors and Hallways 68
- Kitchens 69
- Suggested Kitchen Layouts 70
- Suggested Dining Room Layouts 72
- Suggested Washroom Layouts 73
- Bathtubs and Showers 75
- Suggested Bedroom Layouts 77
- Windows 78
- Code Cross-references 79

PREFACE

This manual has been prepared by the Minister's Barrier-Free Design Committee with the assistance of the Department of Labour to provide designers, builders and other Code users with a guide to building requirements for Albertans with disabilities.

The guide outlines the "minimum building requirements" for persons with disabilities and exceeding these requirements may be preferable in many cases. Designers must pay special attention to their client's individual needs and develop plans accordingly.

This edition of the guide is based on the 1990 Alberta Building Code which is reviewed and revised every 5 years. Your comments and suggestions to the committee are always appreciated.

Extracts from the Alberta Building Code are highlighted in color and are followed, when needed, with a brief explanation of each provision. Illustrations are provided to assist the designers, builders or other Code users in understanding the intent of requirements and the needs of persons with disabilities in places where they live, work, visit or seek entertainment.

The Alberta Building Code outlines the requirements for a broad range of building occupancy classifications where it is expected that facilities normally used by the public would also be used by persons with disabilities. The Code requires that a barrier-free path of travel be provided to these facilities and that freedom of mobility be provided within the building to all public areas. This applies to all new construction, to facilities where there is a change in function from one building code occupancy classification to another and to the alteration or renovation of existing spaces. For new construction the obligations are clear: all provisions of the Code apply. Where there is a change in function from one code occupancy classification to another, then there is an obligation to meet current Code requirements and judgement must be used to bring the building in line with these requirements. An overall plan is needed. A change in function often leads to the need to renovate. Where buildings are being renovated, the Code applies to the areas being altered. For example, if the front entrance to a building is being altered, it must be constructed to conform to the requirements of current code provisions on entrances. If a washroom is being altered or renovated, the requirements that apply to washrooms must be met. Except as explained for specific renovations or for a change in occupancy classification, the current edition of the Code is not applied retroactively to buildings that were lawfully constructed under another edition of the Code.

In the renovation of existing buildings, it may be difficult to make changes that would accommodate current Code requirements. Innovative solutions may be needed to achieve the level of performance required. First, designers must approach the renovation of older buildings by assessing the entire building for compliance with current requirements. Where difficulties are encountered, solutions should be discussed with the building inspector in whose jurisdiction the building is located as soon as possible. Once an overall plan has been developed, the renovations to specific areas can proceed.

ACKNOWLEDGEMENTS

We acknowledge and thank the following individuals and organizations who have contributed to the preparation of this Barrier-Free Design Guide.

Eric Boyd
Premier's Council on the Status of Persons with Disabilities

Mark Iantkow
Canadian Parks Service

Darlene Peterson
Easter Seal Ability Council

Dave Burnett
Alberta Association of the Deaf

David Murray
Alberta Association of Architects

Jim Muir
Alberta Committee of Citizens with Disabilities

Siri Tillekeratne
City of Calgary

Mike Doris
Handicapped Housing Society of Alberta

Dave Collins
City of Calgary

Mary Nett
Canadian National Institute for the Blind

Dave Pinney
Barrier-Free Planning and Design

Tom Parker
Canadian Paraplegic Association

Researched by
Ata Khan and Paul Mousseau
Alberta Labour

Edited by
Gail Helgason

Layout and Illustrations by
Personal Publishing Limited

DEFINITIONS

The Building Code italicizes certain words and phrases and gives them specific meaning.

Access to exit means that part of a *means of egress* within a *floor area* that provides access to an *exit* serving the *floor area.*

Alteration means a change or extension to any matter or thing or to any *occupancy* regulated by the Alberta Building Code.

Assembly occupancy (Group A) means the *occupancy* or the use of a *building*, or part thereof, by a gathering of persons for civic, political, travel, religious, social, educational, recreational or like purposes, or for the consumption of food or drink.

Authority having jurisdiction means an inspector appointed pursuant to Section 2 of the Uniform Building Standards Act.

Barrier-free means that a *building* and its facilities can be approached, entered, and used by persons with physical, mental or sensory disabilities.

Building area means the greatest horizontal area of a *building* above *grade* within the outside surface of exterior walls or within the outside surface of exterior walls and the centre line of *firewalls*.

Building height (in *storeys*) means the number of *storeys* contained between the roof and the floor of the *first storey*.

Business and personal services occupancy (Group D) means the *occupancy* or use of a *building* or part thereof for the transaction of business or the rendering or receiving of professional or personal services.

Dwelling unit means a *suite* operated as a housekeeping unit, used or intended to be used by one or more persons and usually containing cooking, eating, living, sleeping and sanitary facilities.

Exit means that part of a *means of egress*, including doorways, that leads from the *floor area* it serves, to a separate *building*, an open public thoroughfare, or an exterior open space protected from fire exposure from the *building* and having access to an open public thoroughfare.

Fire separation means a construction assembly that acts as a barrier against the spread of fire.

First storey means the uppermost *storey* having its floor level not more than 2 m above *grade*.

Floor area means the space on any *storey* of a *building* between exterior walls and required *firewalls*, including the space occupied by interior walls and *partitions*, but not including *exits, vertical service spaces*, and their enclosing assemblies.

Guard means a protective barrier around openings in floors or at the open sides of stairs, landings, balconies, *mezzanines*, galleries, raised *walkways* or other locations to prevent accidental falls from one level to another. Such barrier may or may not have openings through it.

High hazard industrial occupancy (Group F, Division 1) means an industrial occupancy containing sufficient quantities of highly *combustible,* flammable or explosive materials which, because of their inherent characteristics, constitute a special fire hazard.

Institutional occupancy (Group B, Division 2) means the *occupancy* or use of a *building* or part thereof by persons who require special care or treatment because of mental or physical limitations . . .

Major occupancy means the principal *occupancy* for which a *building* or part thereof is used or intended to be used, and shall be deemed to include the subsidiary *occupancies* which are an integral part of the principal *occupancy.*

Mercantile occupancy (Group E) means the *occupancy* or use of a *building* or part thereof for the displaying or selling of retail goods, wares or merchandise.

Occupancy means the use or intended use of a *building* or part thereof for the shelter or support of persons, animals or property.

Project means any construction, *alteration* or demolition operation.

Residential occupancy (Group C) means the *occupancy* or use of a *building* or part thereof by persons for whom sleeping accommodation is provided, but who are not harboured or detained to receive medical care or treatment or are not involuntarily detained.

Sprinklered (as applying to a *building* or part thereof) means that the *building* or part thereof is equipped with a system of automatic sprinklers.

Storey means that portion of a *building* which is situated between the top of any floor and the top of the floor next above it, and if there is no floor above it, that portion between the top of such floor and the ceiling above it.

Suite means a single room or series of rooms of complementary use, operated under a single tenancy, and includes *dwelling units*, individual guest rooms in motels, hotels, boarding houses, rooming houses and dormitories as well as individual stores and individual or complementary rooms for *assembly, business and personal services,* and *medium* and *low hazard industrial occupancies.*

I. GENERAL DESIGN CONSIDERATIONS

Where do Barrier-Free Requirements Apply?

As a general rule Section 3.7.1. of the Alberta Building Code 1990 (ABC 90) outlines where accessibility must be provided and to what types of buildings.

3.7.1.1. Application

(1) The requirements of this Section apply to all *buildings* except
  (a) houses, including semi-detached, duplexes, triplexes, town houses, row houses and boarding houses, which are not used in social programmes such as group homes, halfway houses and shelters,
  (b) relocatable industrial accommodations,
  (c) *buildings* of Group F, Division 1 *major occupancy* (high hazard industrial occupancy), where only the requirements dealing with hearing sensory provisions would apply, and
  (d) *buildings* which are not intended to be occupied on a daily or full time basis, including automatic telephone exchanges, pumphouses and substations, where only the requirements dealing with hearing sensory provision would apply.

As a general rule, barrier-free design requirements apply to all buildings. The Building Code finds it much easier to list the exceptions to the rule. The single family home, whether an individual house, or part of a complex such as a duplex or town house, is exempt unless it is used to meet social programmes. Provincially-funded residential projects must ensure that a percentage of units meet barrier-free requirements, see Sentence 3.7.1.4.(4). Temporary facilities for housing a construction force are exempt.

Certain industrial facilities are also exempt. Some industrial buildings, for example, pose a greater hazard to their occupants due to dangerous materials or hazardous processes. In some industries, particularly in forestry and metallurgy, the nature of the operation can make barrier-free design impractical. It is intended that Code requirements be applied with discretion to such buildings. If an industrial building also contains space for offices, showrooms or other such uses, it is reasonable to expect that barrier-free access be provided to these areas.

Certain industrial processes can safely employ persons with hearing disabilities. Where persons with hearing disabilities are employed, visual signalling devices must be installed.

Special Considerations and Exemptions

3.7.1.1. Application

(2) The Director may grant relaxation of one or more of the requirements of this Section if an *owner* can demonstrate to the satisfaction of the Director that
   (a) the specific requirements are unnecessary, or
   (b) extraordinary circumstances prevent conformance.

Avoid design errors. It is extremely important to be able to read design drawings with accessibility in mind. The number of consultants with this expertise, and who are not necessarily architects, is increasing. These individuals can help building owners and their designers avoid costly problems of changing something that is already built, but does not work. It is extremely important to catch accessibility problems in the design stage. Errors often lead to requests for special consideration and this is not acceptable.

Should an owner be able to demonstrate that compliance with the barrier-free design requirements does not make sense and is unnecessary, he may apply to the Director of Building Standards for special consideration and exemption from compliance. An example of such a building could be a processing plant in an extremely remote area not serviced by public roadways.

Renovations to existing facilities can at times be difficult to handle. Sketches must be drawn up to show how the building can be updated to present code requirements. Questions often arise regarding the overall plan to make the building barrier-free. It is important to explain in an overall development plan how accessibility will be achieved. At times circumstances will not permit a practical solution and special considerations must be explored. Exemptions are considered by the Director on an individual basis and in consultation with the building inspector in whose area the project is proposed.

3.7.1.1. Application

(3) *Buildings* required to be *barrier-free* must comply with all requirements designed to assist those persons with physical, sensory and mental disabilities.

To what degree must a building comply? Designers must keep a variety of disabilities in mind as people with a variety of disabilities may be using the building. Some solutions will address one disability and not others. The trick lies in removing as many barriers as possible with each detail.

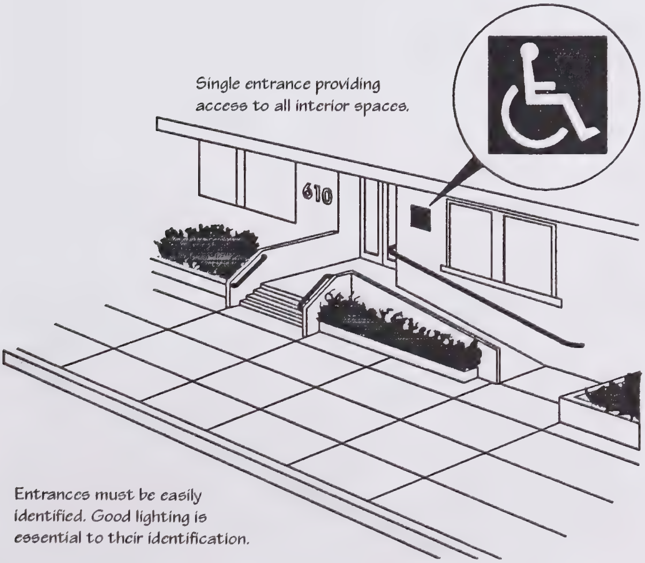
Unfortunately, what will help some might hinder others. For instance, the installation of a curb cut/ramp for persons in wheelchairs removes one of the sidewalk/street reference points for persons who are blind or visually impaired. Deep grooves detectable with a cane and running parallel with the slope of the ramp are often used to mark the street location.

Special Requirements for Residential Projects

3.7.1.1. Application

(4) If a residential project is funded in part or in whole by the Government of Alberta, *dwelling units* meeting *barrier-free* design requirements shall be provided as follows
- (a) 2 or more in a *project* of 10 to 25 *dwelling units*,
- (b) 5 or more in a *project* of 26 to 50 *dwelling units*,
- (c) 10 or more in a *project* of 51 to 100 *dwelling units*,
- (d) 15 or more in a *project* of 101 to 200 *dwelling units*, and
- (e) 20 or more in a *project* exceeding 200 *dwelling units*.

In housing projects which have provincial government funding, a specific proportion of the dwelling units must be specially designed for persons with disabilities. Flexibility must be kept in mind which would allow units to be adaptable to the needs of various types of disabilities.



Single entrance providing access to all interior spaces.

Entrances must be easily identified. Good lighting is essential to their identification.

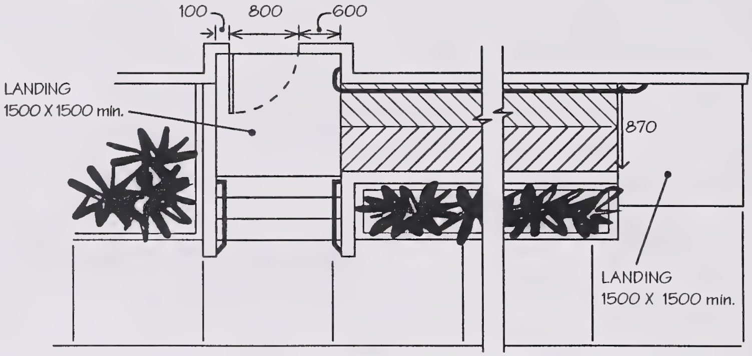
Accessible Entrances

3.7.1.2. Entrances

(1) Except as required in Sentence (2), every *building* referred to in Article 3.7.1.1. shall have at least one entrance intended for general use by the public or the occupants designed in conformance with Article 3.7.3.3. and opening to the outdoors at sidewalk level or to a ramp conforming to Article 3.7.3.4. leading to a sidewalk.

Having identified the building to which barrier-free design requirements apply, a barrier-free entrance must also be provided. Guidance on the design of the doorway is given in Article 3.7.3.3. and on the design of a ramp in Article 3.7.3.4.

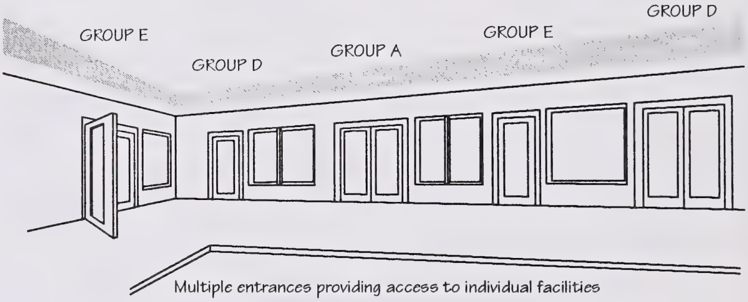
There is a trend to increase building security by providing fewer entrances for use by the public. Though only one entrance needs be identified and designed to be barrier-free, all doors designated for use by the public should be made accessible. A staff entrance should not be the designated entrance. Access must extend from the edge of the property to the entrance.



A RAMP RISE OF 450mm REQUIRES A LENGTH OF 5400mm.

3.7.1.2. Entrances

(2) Where a *suite* of Group A (assembly), D (business and personal services) or E (mercantile) *occupancy* is located in the *first storey* of a *building* or in a *storey* to which a *barrier-free* path of travel is provided and is completely separated from the remainder of the *building* so that there is no access to the remainder of the *building*, such *suite* shall have at least one *barrier-free* entrance in conformance with Sentence (1).

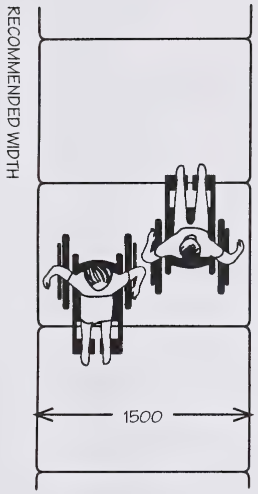


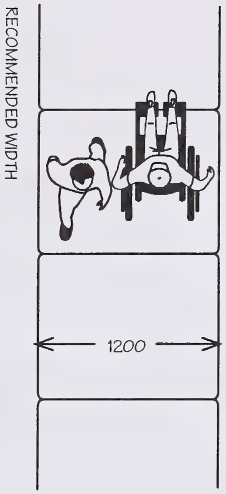
Multiple entrances providing access to individual facilities

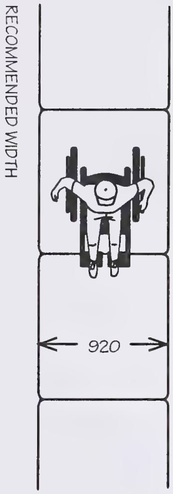
Some buildings are divided into areas that are not interconnected on the inside. Barrier-free entrances must be provided to these facilities from the outside. For example, a strip shopping centre can have a number of shops, offices or restaurants that are only accessible from the outside. The entrances to all these facilities must be made barrier-free.

Barrier-Free Path of Travel

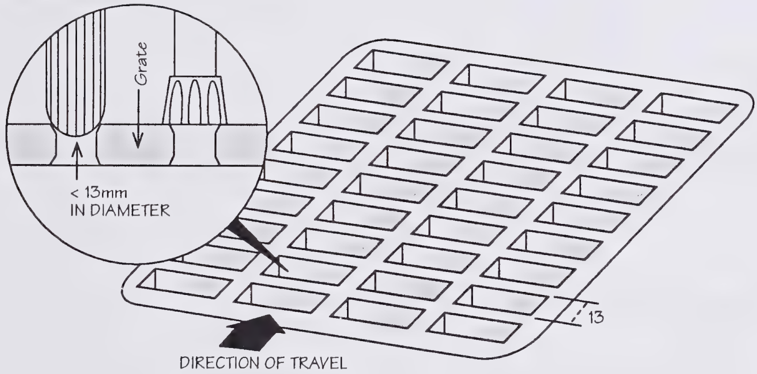
3.7.1.3. Barrier-Free Path of Travel



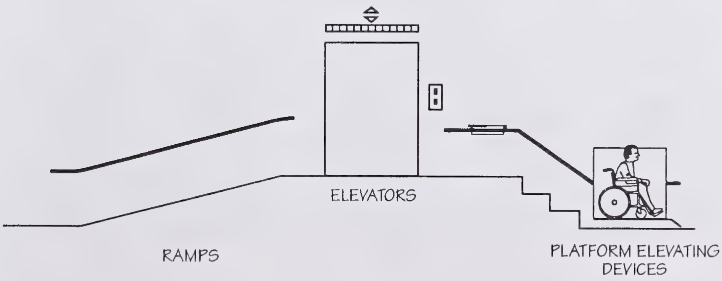




Openings larger than 13mm may catch wheelchair wheels or canes, and may cause a person to trip.



BARRIER–FREE PATH OF TRAVEL MAY INCLUDE:



(1) Except as permitted in Subsection 3.7.3., every *barrier-free* path of travel shall provide an unobstructed width of not less than 920mm for the passage of wheelchairs.

(2) Floor surfaces along a *barrier-free* path of travel shall have no opening that will permit the passage of a sphere more than 13mm diam.

(3) A *barrier-free* path of travel is permitted to include ramps, elevators or other platform elevating devices where there exists a difference in elevation.

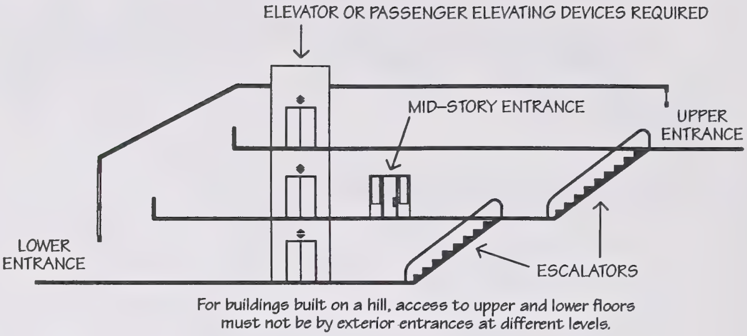
The minimum width that should be considered for the movement of a wheelchair is 920mm however this width will not allow a person to pass a person in a wheelchair with any ease.

Floor surfaces, walks, ramps, stairs and curb ramps in a barrier-free access shall be stable, firm and slip resistant. Grates must not have any opening larger than 13-mm in diameter. If the gratings have elongated openings, they should be placed so the long dimension is perpendicular to the direction of travel.

There are three basic ways of moving persons in a wheelchair from one level to an other; by use of a ramp, a special designed motorized platform or an elevaotor.

3.7.1.4. Storeys Served by Escalators.

Where escalators provide access to *storeys* above or below the *first storey*, a *barrier-free* path of travel shall be provided to those *storeys* served by the escalator.



For buildings built on a hill, access to upper and lower floors must not be by exterior entrances at different levels.

Malls and department stores often rely on escalators to move people from one storey to another. Where escalators are provided for the movement of people from one level to another, elevators or passenger elevating devices must also be provided. On a sloping site, wheelchair users might be able to gain access to another level by means of an exterior walkway, however this arrangement does not meet the intent of the Code. A wheelchair user should not be required to travel outside the building to gain access to another level. Such buildings require that elevators or platform lifting devices be provided, and that their location should be clearly indicated.

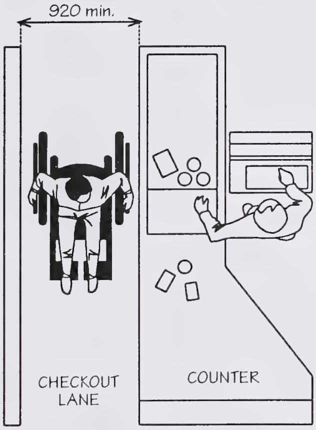
Occupancy Requirements

Once inside a building, what areas must be barrier-free?

3.7.2.1. Areas Requiring Barrier-Free Access

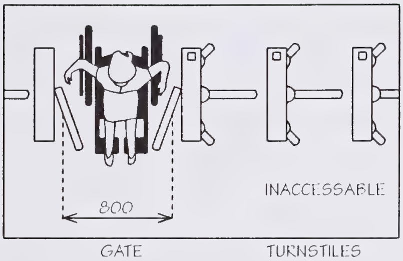
(1) Except as provided in Sentence (2), a *barrier-free* path of travel shall be provided
  (a) into each *suite*,
  (b) into rooms or areas that serve the public or are designated for use by visitors, including areas in *assembly occupancies* with fixed seats, display areas and merchandising departments,
  (c) into rooms or areas for student use in *assembly occupancies*,
  (d) into general work areas, including office areas,
  (e) into general use or general service areas, including shared laundry areas in *residential occupancies*, recreational areas, cafeterias, lounge rooms, lunch rooms and infirmaries,

(f) into outpatient facilities, and sleeping rooms in hospitals and nursing homes,
(g) into not less than one passenger type elevator or elevating device conforming to Article 3.7.3.5,
(h) into washrooms described in Article 3.7.2.3.,
(i) to any facility required by this Section to be designed to accommodate disabled persons,
(j) onto every balcony provided in conformance with Sentence 3.3.1.7.(1), and
(k) to all service counters used by the general public.
(See Article 3.3.1.7. for additional fire safety measures.)

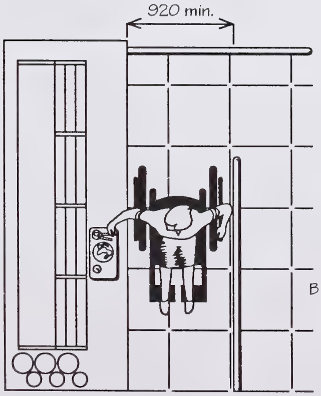


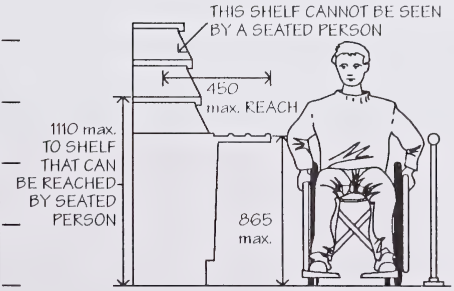
(2) Except as provided in Sentence (3), Sentence (1) does not apply to *storeys* above or below the *first storey* of a *building* that does not exceed 2 *storeys* in *building height*, where the *storey* does not exceed 600m^2 in area.

(3) Sentence (1) does not apply to *storeys* above or below the *first storey* in *buildings* of Group C *occupancy* which do not exceed 3 *storeys* in *building height* or 600m^2 in *building area* and are not served by a passenger type elevator or other platform equipped passenger elevating device.



As a general rule, accessibility must be provided to all storeys. Sentence (1) describes the areas to which barrier-free design requirements apply. Sentences (2) and (3) are exceptions. In two storey buildings where the floor area of the second floor or basement does not exceed 600m^2, accessibility to those floors need not be provided. In three storey apartments where an upper floor or basement does not exceed 600m^2 and elevator or platform lifts are not provided, the barrier-free design requirements need only be provided to the first floor.




THIS SHELF CANNOT BE SEEN BY A SEATED PERSON
450 max. REACH
1110 max. TO SHELF THAT CAN BE REACHED BY SEATED PERSON
865 max.

Barrier-free access must be provided into suites or rooms, but not necessarily throughout the whole suite or room. For instance, barrier-free access must be provided into fitting rooms in clothing sales areas (department stores, etc.), changing rooms or lockers in a swimming pool or other recreation facilities, but need not be provided to service rooms housing building service equipment. In general, access is required to areas that the public would use or to areas where an individual with a disability might work.

Some examples of service counters used by the general public are ticket counters, refreshment stands, drinking fountains, cafeteria counters, checkout counters and bank service counters.

It is not intended that all spaces be made one hundred percent accessible, but that a sufficient portion be accessible so that the service needs of persons with disabilities are also being met.

Fire Safety Measures

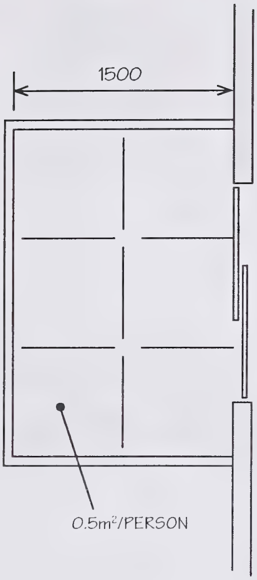
For buildings that are not protected by an automatic fire suppression system, there are other safety measures that can be taken.

3.3.1.7. Protection on Floor Areas with a Barrier-Free Path of Travel

(1) Where a *barrier-free* path of travel is provided above or below the *first storey* in a *building* that is not *sprinklered*, every *floor area* having a *barrier-free* path of travel shall
  (a) be served by an elevator conforming to Sentences 3.2.6.9.(4) to (6), protected against fire in conformance with Clauses 3.2.6.9.(3)(b) or (c),
  (b) be divided into not less than 2 zones by *fire separations* conforming to Sentences 3.3.3.6.(8) and (9) so that,
    (i) persons with physical disabilities can be accommodated in each zone, and
    (ii) the travel distance from any point in one zone to a doorway leading to another zone shall be not more than the value for travel distance permitted by Sentence 3.4.2.5.(1) for the *occupancy* classification of the zone, or
  (c) in the case of *residential occupancies*, be provided with balconies that,
    (i) are not less than 1.5 m deep from the outside face of the exterior wall to the inside edge of the balcony, and

(ii) provide not less than 0.5m^2 of balcony space for each occupant of the suite, except on the *storey* containing the access entrance described in Article 3.7.1.2., or

(d) have an exterior *exit* at ground level or a ramp leading to ground level.



PREFERRED VALUE
ALLOW .95m^2
FOR WHEELCHAIRS
ALLOW .4m^2
FOR PERSON STANDING

BALCONY

The above measures are intended to provide temporary places of refuge for persons with disabilities. As is in all situations, a plan to evacuate persons with disabilities must be developed. Details for such a plan are contained in the Alberta Fire Code.

In unsprinklered buildings, it is necessary to take additional measures to ensure the safety of persons with disabilities and those who may require assistance to flee a burning building. Four measures are suggested; the first may be the most practical. The first option requires that an elevator be installed meeting CSA standard B44, the electrical system serving the elevator be protected against the effects of fire, and a zone be created around the elevator doors by means of a vestibule or corridor that is protected by fire resistive construction. This protected elevator is intended to be used by fire fighters to evacuate persons with disabilities. It is not intended that this elevator be used without the assistance of fire fighters.

The second option divides the floor area into at least two zones by fire resistive construction, reinforces the doors abilities to retard the passage of smoke between zones and limits the travel distance to another zone. In office buildings the limit is 40m and for all other occupancies it is 30m. Estimating the size requirement of each zone will be tricky especially where the facility attracts a large number of individuals who are disabled.

The third option (limited to residential occupancies) relies on the ability to find refuge on an exterior balcony and wait there for assistance. The balcony door threshold must allow the passage of a wheelchair.

The fourth concept recognizes the inherent safety factor of being able to exit directly to the outdoors.

II. SITE DEVELOPMENT

Access to and from Parking

3.7.2.1. Areas Requiring Barrier-free Access.

(4) A *barrier-free* path of travel shall be provided from the entrance described in Article 3.7.1.2. to
  (a) an exterior parking area, where exterior parking is provided, and
  (b) at least one parking level, where parking is provided in a parking structure, and to every level of the parking structure, where it is served by a passenger elevator.

There must be a well lit, distinguishable, barrier-free path from the building entrance to parking areas. It should be the one normally used by building occupants. The use of lighting, contrasting colours, changes in texture and handrails will all help to identify the path. Floors within parking structures served by elevators must be accessible. Two storey parking structures under 600m^2 need not have elevators or provide access to the basement or second storey.

Parking spaces designated for individuals with disabilities should be as close to the elevator or an accessible entrance as possible. The accessible parking level should allow sufficient vertical clearance to accommodate the vehicles used by drivers or passengers who are disabled (min. 3000mm).

Parking

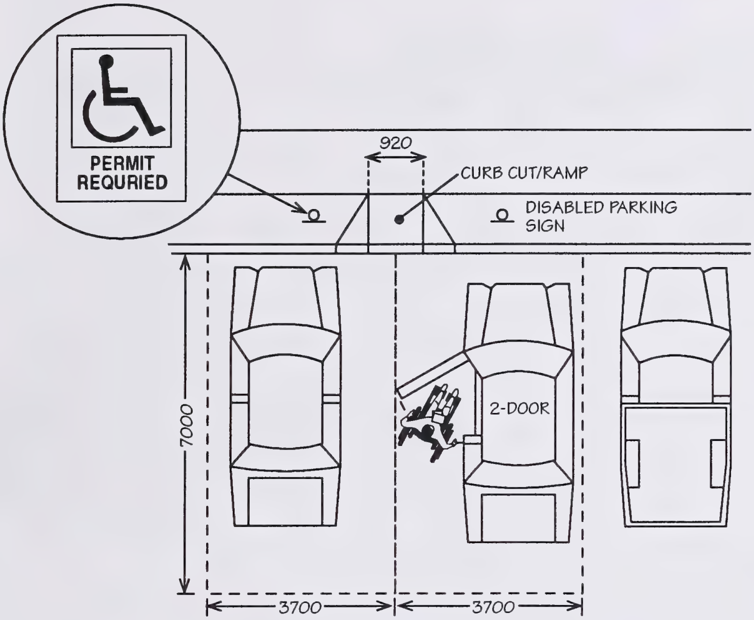
3.7.2.4. Parking

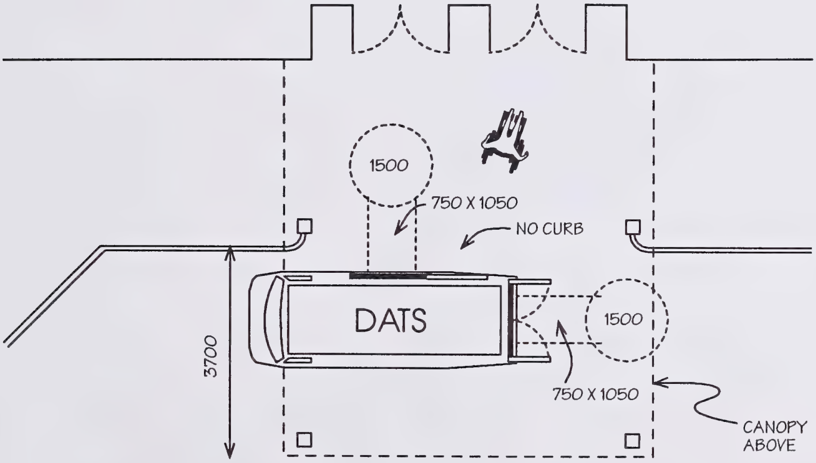
(1) Except as provided in Sentence (2), where on-site parking will be provided pursuant to the Planning Act, one parking stall for disabled persons shall be provided for each *dwelling unit* required in Sentence 3.7.1.1.(4) and for each viewing position in *assembly occupancies* required in Article 3.7.2.2.
(2) Where on-site parking will be provided pursuant to the Planning Act, and more than 50 stalls are required, parking stalls for use by disabled persons shall be provided in the ration of 1 for every 100 or part thereof.
(3) Stalls in Sentences (1) and (2) shall
  (a) be at least 3.7m wide,
  (b) have a firm, slip-resistant and level surface,
  (c) be located close to an entrance required to conform with Article 3.7.2.1., and
  (d) be clearly marked as being for the use of disabled persons only.

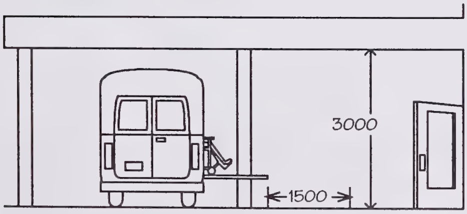
NO. OF SUITES	STALLS REQUIRED
X	X

NO. OF VIEWING SPACES	STALLS REQUIRED
Y	Y

TOTAL SPACES	MINIMUM REQUIRED
0 – 50	–
51 – 100	1
101 – 200	2
201 – 300	3
ETC.	







When the Planning Act requires parking, one parking stall for persons who are disabled must be made available in government-funded housing for each barrier-free unit provided. When spectator seating is provided, one stall will be available for each designated wheelchair spaces.

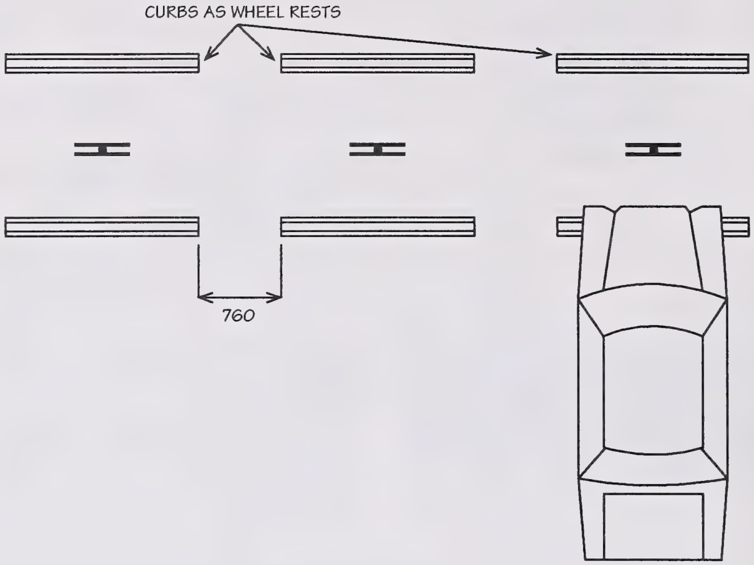
In cases where on-site parking of more than 50 stalls are required, one stall for use by an individual with disabilities must be provided for each 100 stalls (or portion thereof). Sentence (3) describes the dimensions and characteristics of the space. Asphalt, concrete or firm gravel are acceptable surfaces. Parallel parking stalls should be 7m in length. Accessible passageways may take the form of walks, ramps, etc. An accessible passageway must be provided to the barrier-free building entrance from sidewalks, roadways or parking areas. Parking stalls for use by persons who are disabled must be identified with the international symbol of accessibility and should include the words "Permit Required." Parking should be arranged in such a way that users of wheelchairs do not have to pass behind parked cars.

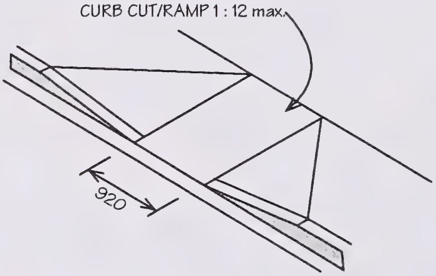
Passenger Loading Zones

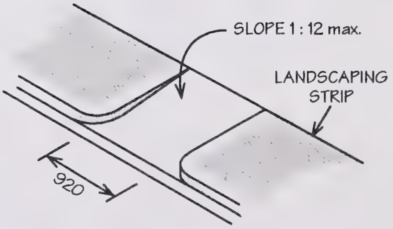
Where a passenger loading zone is provided, accommodations should be made for side or rear loading/unloading operations. The majority of vehicles are equipped with side operating platforms which are 760mm wide by 1050mm long and can discharge patrons at sidewalk level. An area of 1500 by 1500mm is required beyond the platform to allow a person in a wheelchair to turn around and move in a new direction. A minimum height clearance of 3000mm needs to be provided for most van type transporters. If the wheelchair lift is mounted on the rear, a curb cut/ramp may be required.

Curbs

Where curbs are used within parking areas, providing openings for wheelchair passages is appreciated. These openings should be at least 760mm wide. Such curbs are often used as wheel rests and prevent cars from rolling forward, however, they also prevent wheelchair users from cutting through parking lots. Curbs of any kind will be more easily detected by persons whose visability is impaired if colour is used to distinguish curbs from surrounding surfaces. To gain access to the sidewalk, where it is separated by a curb and change in elevation, a small road side ramp is required. We will refer to these as curb cut/ ramp.

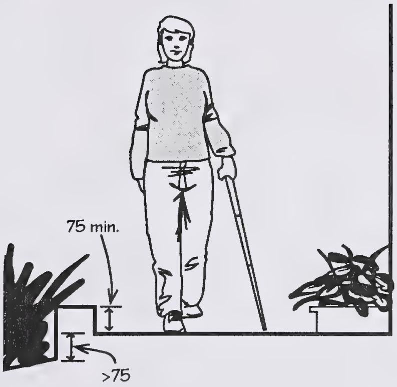






Exterior Walks and Ramps

3.7.3.2. Exterior Walks

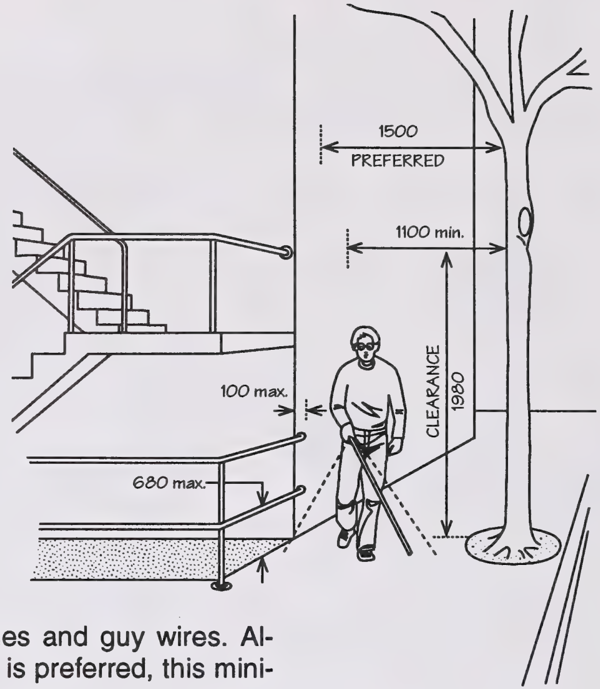


(1) Exterior walks that form part of a *barrier-free* path of travel shall
   - (a) be provided by means of a continuous plane not interrupted by steps or abrupt changes in level,
   - (b) have a permanent, firm and slip-resistant surface,
   - (c) have a minimum uninterrupted width of 1100mm, and a gradient not exceeding 1 in 20,
   - (d) have a minimum 75mm high curb where, in the absence of walls, railings, or other barriers on either or both sides of the walk, the vertical drop from the walk exceeds 75mm,
   - (e) have a minimum 1100mm wide surface of a different texture to that surrounding it, where the line of travel is level and even with adjacent walking surfaces,
   - (f) be free from obstructions for the full width of the walk to a minimum height of 1980mm, except that handrails are permitted to project not more than 100mm from either or both sides into the clear area;
   - (g) be designed as a ramp where the gradient of the walk is greater than 1 in 20, and
   - (h) have a level area adjacent to the entrance doorway conforming to Clause 3.7.3.4.(1)(c).

Where more than one exterior walk leads to a building required to be barrier-free and though only one needs to comply with the barrier-free requirement, all designated public access routes should be designed to meet the need of persons with disabilities. Walks must have an even surface and permit a continuous and uninterrupted path of travel.

An exterior walk must be at least 1100mm wide. This minimum width requirement allows a person in a wheelchair to pass an ambulatory person with ease. The preferred width which would allow one wheelchair to pass another is 1500mm. Adjacent to an entrance, a levelled area of at least 1500 by 1500mm is needed.

It is important to note that the surface of a walk must be firm and even. Uneven surfaces can be hazardous, not only to a person in a wheelchair but also to an ambulant person. When precast units such as brick pavers, concrete slabs or tiles are used, care must be taken to ensure that all joints are as flush as possible, with a tolerance of 6mm being the preferred upper acceptable limit. In all cases, the selected material must also be slip-resistant. To assist persons with visual impairments, the surface of the walk should be easily discernible from the surrounding areas.



It is recommended that gratings be avoided on walks. If they are used, they should not allow a sphere 13mm in diameter to pass through.

Pathways across parking lots and large plazas can be identified in a number of ways. Designers often use different textures and contrasting colours to delineate paths.

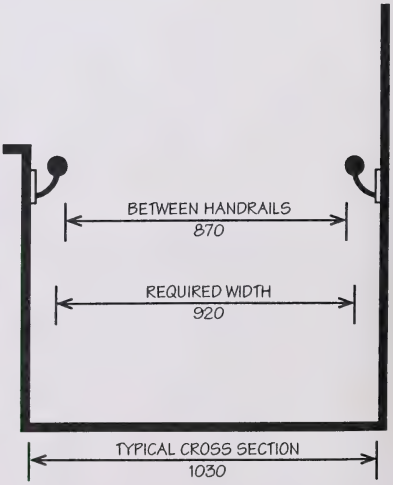
The requirement to have an area free from obstructions is primarily to aid persons with visual impairments. Handrails and other projections less than 100mm are permitted. Examples of such obstructions are directional signs, tree branches and guy wires. Although a clearance of greater than 1980mm is preferred, this minimum height corresponds to the minimum headroom clearance for doorways.

Any part of a path which has a slope steeper than 1 in 20 in a barrier-free path of travel must be designed as a ramp. A 75mm curb is required to help guide a sight impaired person using a cane and to prevent the front guide wheels of a wheelchair from accidentally going over the edge where the drop off exceeds 75mm.

Ramps

3.7.3.4. Ramps

(1) Ramps located in a *barrier-free* path of travel shall
   (a) have a width of not less than 870mm between handrails,
   (b) have a gradient of not more than 1 in 12,
   (c) have a level area not less than 1500 by 1500mm at the top and bottom and at intermediate levels of a ramp leading to a door, so that the level area extends not less than 600mm beyond the latch side of the door opening, except that where the door opens away from the ramp, the area extending beyond the latch side of the door opening may be reduced to 300mm,

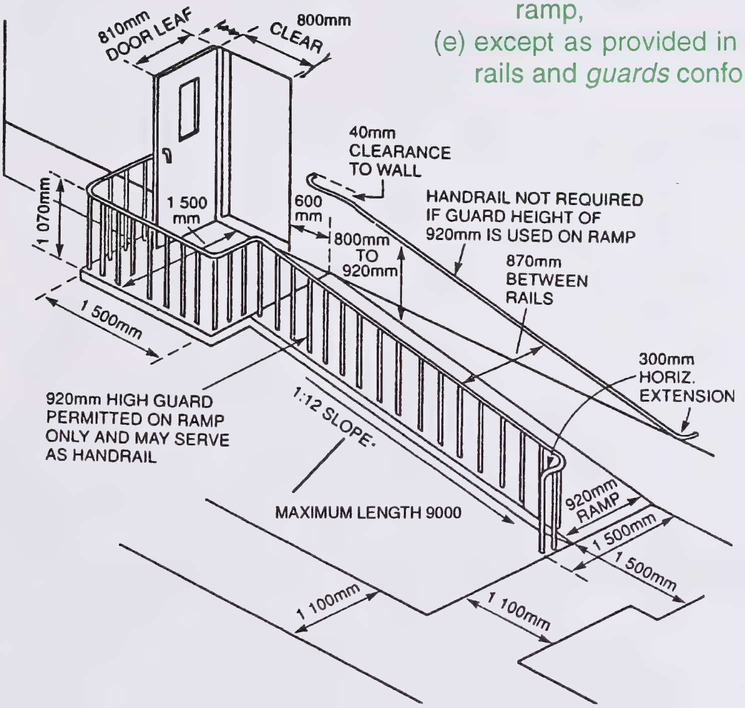


(d) have a level area not less than 1200mm long and at least the same width as the ramp
  (i) at intervals of not more than 9m along its length, and
  (ii) where there is an abrupt change in the direction of the ramp,

(e) except as provided in Sentence (2) be equipped with handrails and *guards* conforming to Articles 3.4.6.4. and 3.4.6.5.,

(f) have a slip-resistant, continuous and even surface, and

(g) have walls, railings or other barriers that extend to within 75mm of the finished ramp surface or a 75mm high curb.



Ramps with a gradient of more than 1 in 16 can be difficult for some with limited upper body mobility to manage. Even though they pose less of a problem for people in motorized wheelchairs, such ramps can be unsafe to descend, especially in cold climates. Although Article 3.7.3.4. permits slopes on ramps of 1 in 12 for distances of up to 9m, gradients of 1 in 20 are safer and less strenuous. A strip contrasting in colour and texture shall be used at the top of ramps to warn people of a downward change in elevation.

Ramps in a barrier-free path of travel must have a minimum unobstructed width of 870mm and a maximum slope of 1 in 12.

A level landing of at least 1500 by 1500mm is required at the top and bottom of the ramp. Intermediate landings shall be provided at intervals of not more than 9m. This allows an opportunity for a person to stop and rest if necessary. These landings should be at least the width of the ramp by 1200mm.

Where ramps are used and are not part of a barrier-free path of travel, the maximum gradient may exceed 1 in 12 and is dependent on the type of occupancy involved. Where alternate routes are provided for persons with disabilities, signs are required to give direction. (See article 3.4.6.6.)

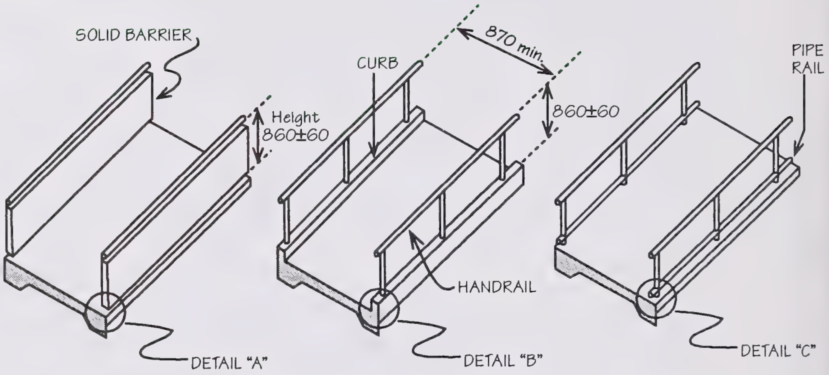
RAMP

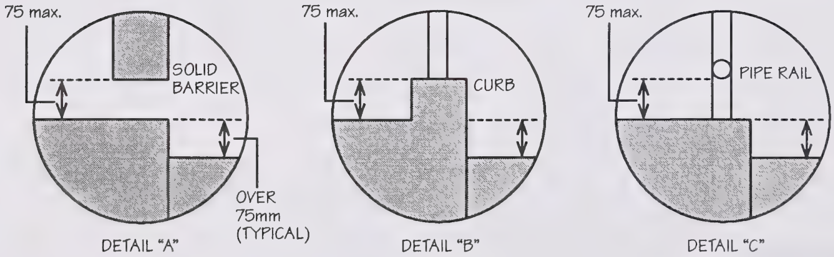
3.4.6.6. Ramp Gradients

(1) The maximum gradient of ramps shall be,
- (a) 1 in 10 in any Group A, B or C *occupancy*,
- (b) 1 in 6 in rooms or *floor areas* classified as Group E or Group F *occupancy*,
- (c) 1 in 8 from any other *floor area*, and
- (d) 1 in 10 for every exterior ramp.

(See also Article 3.7.3.4.) Ramps as described in Article 3.7.3.4. used in barrier-free path of travel are limited to a slope gradient of 1 in 12.

Protection At Sides Of Ramps. A variety of solutions can be used to prevent wheelchairs from accidentally going over the edge of a ramp. These are often combined with handrails and guards.





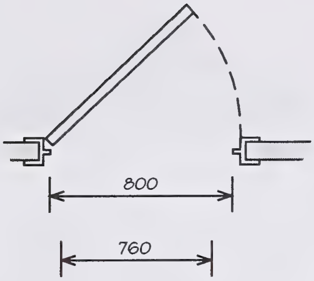
3.7.3.4. Ramps

(2) Where a ramp serves as an aisleway for fixed seating, the requirement for handrails in Clause 3.7.3.4.(1)(e) need not apply.

3.7.3.4. Ramps

(3) Floors or walks in a *barrier-free* path of travel having a slope steeper than 1 in 20 shall be designed as ramps.

III. CIRCULATION



Doorways

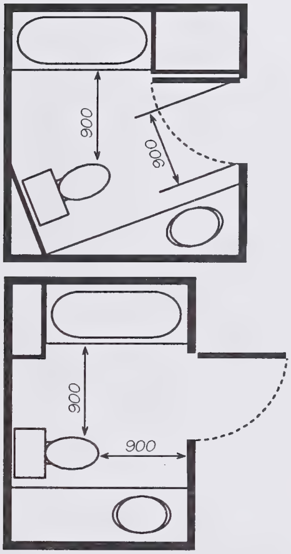
3.7.3.3. Doorways and Doors

(1) Every doorway that is located in a *barrier-free* path of travel shall have a clear width of not less than 800mm when the door is in the open position and the door shall be openable with one hand.

Doorways
Every doorway in a *barrier-free* path of travel shall have a clear opening width of 800mm and must be easy to open.

3.7.3.3. Doorways and Doors

(2) The doorway to at least one bathroom within a *suite* of *residential occupancy* shall have a clear width of not less than 760mm when the door is in the open position.



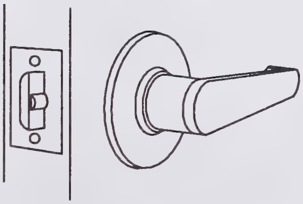
Washrooms In Residential Occupancies
While there are no requirements to make these washrooms large enough to allow someone in a wheelchair to turn around in, a door 760mm wide is required on at least one washroom to allow the passage of a wheelchair. Through the careful planning and positioning of fixtures, a washroom not much larger than a conventional washroom could be made accessible.

More and more, the hotel industry is making a variety of specifically designed rooms available for seniors and many are also suitable for wheelchairs.

Designers should be planning all washrooms with wheelchair access in mind. The placement of fixtures and the ability to transfer to these must be considered. Wall systems must be reinforced for anticipated grab bar installations.

3.7.3.3. Doorways and Doors

(3) Door operating devices shall be of a design which does not require tight grasping and twisting of the wrist as the only means of operation.



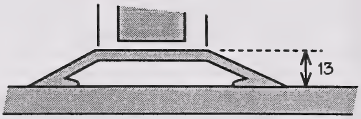
Lever handles
Lever handles that do not require a grasping and twisting motion are ideally suitable for use in barrier-free design. Lever handles with the end turned towards the door are less prone to catch the clothing of someone passing by.

For persons with limited movement in their hand, knob type handles that require a turning motion are difficult to grip. It is recommended that lever handles be used on doors which are latched.

3.7.3.3. Doorways and Doors

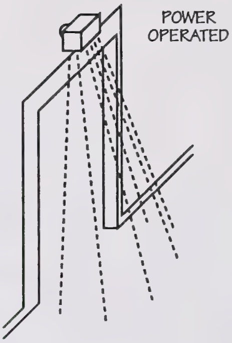
(4) Thresholds for doorways referred to in Sentences (1) and (2) shall be not more than 13mm higher than the finished floor surface and shall be bevelled to facilitate the passage of wheelchairs.

Thresholds
For ease of wheelchair passage and to avoid tripping, raised thresholds for doors should be avoided. Where they are necessary they must not exceed 13mm in height above the finished floor surface. Bevelled edges are also a help. A small ramp configuration may be needed in some cases, such as for sliding doors.



3.7.3.3. Doorways and Doors

(5) Except as permitted in Sentence (6), the door for the entrance described in Article 3.7.1.2. shall be equipped with a power door operator in
- (a) hotels,
- (b) *buildings* of Group B, Division 2 (Institutional) *major occupancy*, and
- (c) *buildings* of Group A (Assembly), D (Business and Personal Services) or E (Mercantile) *major occupancy* more than 500m^2 in *building area*.



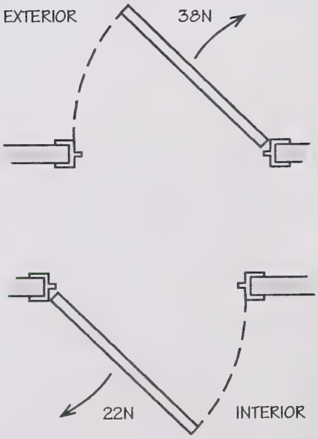
3.7.3.3. Doorways and Doors

(6) The requirements in Sentence (5) do not apply to an individual *suite* having an area of less than 500m^2 in *buildings* having only *suites* of Group A (assembly), D (business and personal service) or E (mercantile) *occupancy* where such *suite* is completely separated from the remainder of the *building* so that there is no access to the remainder of the *building*.

Automatic Door Openers
Power operated doors, which are activated by a motion detector or by a pressure plate, meet the Code requirement. In cases where security is required, the doors may be activated by a key, card or radio transmitter. The doors should be identified with the international symbol for accessibility. The location of the activating devises must not interfere with the movement of the wheelchair. In the event of a power failure, power operated doors must be openable manually.

3.7.3.3. Doorways and Doors

(7) Except as permitted in Sentence (8) and except for doors with power door operators, closers for doors in a *barrier-free* path of travel shall be designed to permit doors to open when a force of not more than 38N is applied to the handles, push plates or latch-releasing devices in the case of exterior doors and 22N in the case of interior doors.



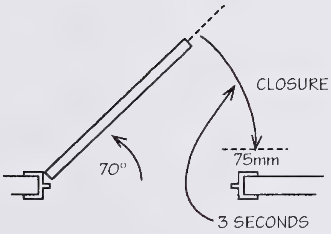
Strength
Except for doors to dwelling units, door closers must permit the opening of an exterior door with a force of 38N or less and an interior door with a force of 22N or less.

3.7.3.3. Doorways and Doors

(8) Sentence (7) does not apply to doors at the entrances to *dwelling units*, or where greater forces are required in order to close and latch the doors against prevailing differences in air pressures on opposite sides of the doors.

Air Pressure Differences

Differences in air pressure on opposite sides of a door may be due to the operation of mechanical systems such as those associated with smoke control. The so-called "stack-effect" in buildings can cause a negative pressure due to the buoyancy of warm air. This is usually most noticeable between stairwells and the remainder of the building, and at the entrances to buildings; the taller the building, the greater the effect can be. Doors with automatic closers have to operate with sufficient opening force to allow the return action to overcome the differential pressure.

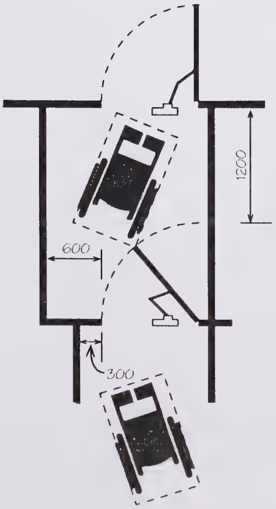


3.7.3.3. Doorways and Doors

(9) Except for doors at the entrances to dwelling units, closers for interior doors in a *barrier-free* path of travel shall have a closing period of not less than 3s measured from when the door is in an open position of 70° to the doorway, to when the door reaches a point 75mm from the closed position, measured from the leading edge of the latch side of the door.

Closing Time Of Doors

In some circumstances, closers with a delay feature which keeps the door open for several seconds before it begins to close might be desirable. However, closers with this feature have limited backcheck, a feature of a normal door closer where resistance to opening increases as the door reaches the full arc of swing. Doors equipped with this type of closer are therefore more susceptible to damage should the door be opened with too much force or should someone try to force it closed, thinking the closer has failed to operate. Delayed action closers are susceptible to vandalism and are not recommended for such occupancies as schools.



3.7.3.3. Doorways and Doors

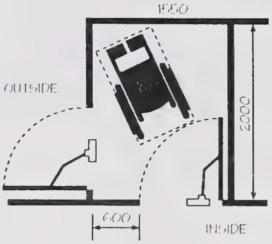
(10) Every door equipped with a closer in a *barrier-free* path of travel shall have a clear space beyond the latch side of not less than
(a) 600mm where the door swings towards the approach side, and
(b) 300mm where the door swings away from the approach side.

Clearances

Sufficient clearance must be provided on the latch side of doors for a user to operate the door latch and to be able to open the door without interference from the wheelchair. This is particularly important where the door swings towards the approach side. Although the requirement applies to doors equipped with closers only, this clearance should be provided for all doors.

3.7.3.3. Doorways and Doors

(11) Vestibules located in a *barrier-free* path of travel shall be arranged to allow the movement of wheelchairs between doors and shall provide a distance between 2 doors in series of not less than 1200mm plus the width of any door that swings into the space in the path of travel from one door to another.



Vestibules
For a person to open a door from a wheelchair, sufficient unobstructed space is required at the latch side of the door. If the door swings towards the wheelchair (PULL), then at least 600mm clear space is required. If the door swings away from the wheelchair (PUSH), then at least 300mm clear space is required.

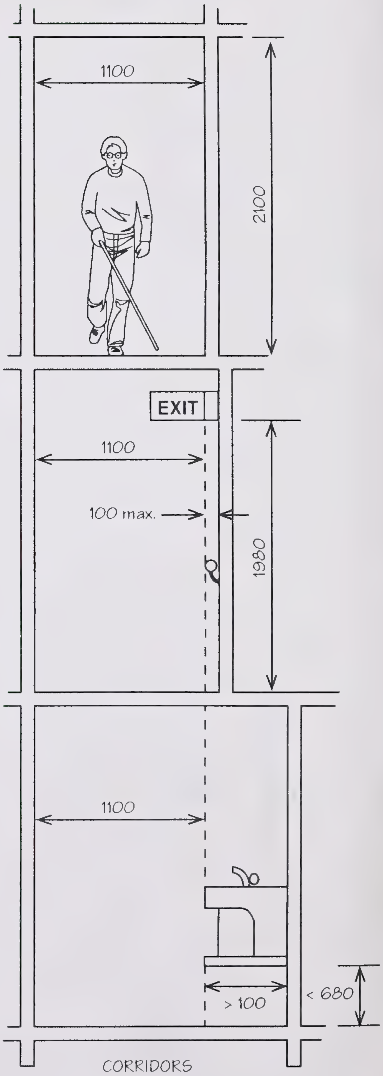
The Identification of entrances should be done by using contrasting colours for door frames, handles, etc. Entrances and vestibules should be well lit.

Corridors

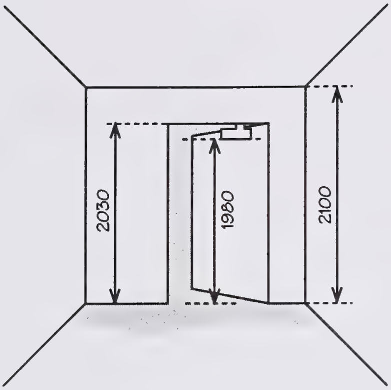
3.3.1.9. Corridors

(1) The minimum width of every *public corridor* shall be 1100mm.
(2) Except in hospitals where it is necessary to move patients in beds, the minimum unobstructed width of every corridor used by the public and every corridor serving classrooms or patients' sleeping rooms shall be 1100mm.
(3) Except as provided in Sentence (4), obstructions located within 1980mm of the floor shall not project more than 100mm horizontally into *exit* passageways, *public corridors*, corridors used by the public or corridors serving classrooms or patients' sleeping rooms in a manner that would create a hazard for visually impaired persons travelling adjacent to walls.
(4) The horizontal projection of an obstruction in Sentence (3) is permitted to be more than 100mm where it extends to less than 680mm above the floor.

The sweep of a cane used by blind or visually impaired persons normally detects obstructions that are within 680mm of the floor. Any obstruction above this height would not normally be detected and can, therefore, create a hazard if it projects more than 100mm into the path of travel.



CORRIDORS



Overhead Hazard

Headroom Clearance

3.3.1.8. Headroom Clearance (Corridors)

Except within the *floor area* of a *storage garage,* the minimum headroom clearance in every *access to exit* shall conform to the requirements in Article 3.4.3.7. for *exits.*

Walks, halls, corridors, passageways, aisles or other circulation spaces shall have 2100mm of headroom. If the overhead clearance is reduced then a barrier detectable with a cane should be used. A person can best detect objects low to the ground if the objects are less than 680mm.

3.4.3.7. Headroom Clearance (Exit)

(1) Except as provided in Sentences (2) to (4), every *exit* shall have a headroom clearance of not less than 2100mm.
(2) The headroom clearance for stairways measured vertically above any landing or the nosing of any stair tread shall be not less than 2050mm.
(3) The headroom clearance for doorways shall be not less than 2030mm.
(4) No device such as a door closer shall be installed so as to reduce the headroom clearance of a doorway to less than 1980mm.

Stairs, Handrails and Guards

Stairs

3.4.6.1. Slip Resistance of Stairs and Ramps

(1) Treads and landings of interior and exterior stairs and ramps accessible to the public shall have a slip-resistant finish or be provided with slip-resistant strips which extend not more than 1mm above the surface of the tread, landing or ramp.
(2) Treads and landings of exterior *exit* stairs more than 10m high shall be designed to be free of ice and snow accumulations.

Slip resistance is a difficult concept to deal with. Floor surfaces have a feel to them and any sudden change can be hazardous. Water and ice on a floor surface most often creates a very slippery condition, especially when a person unexpectedly goes from a dry surface to a wet one. There are coatings that will minimize this effect and these should be tried. On the other hand the use of grit — sand paper like strips — can cause one to stumble. A slightly more abrasive surface than the one being walked on is all that is needed in most instances.

3.4.6.2. Minimum Number of Risers.

Every flight of interior stairs shall have not less than 3 risers.

In a path of travel from one area to another, stairs having fewer than three risers should be avoided. With only one or two risers the perception of a change in elevation is difficult, three risers makes a more definite statement.

This is not to say that within a space, platforms with one or two risers can not be used; however, it must be remembered that stairs are an impediment to those with mobility problems. Restaurants which use elevated areas to define spaces should provide ramps to some of these areas or provide equally interesting spaces for persons in wheelchairs at the entrance level.

3.4.6.7. Stair Treads and Risers

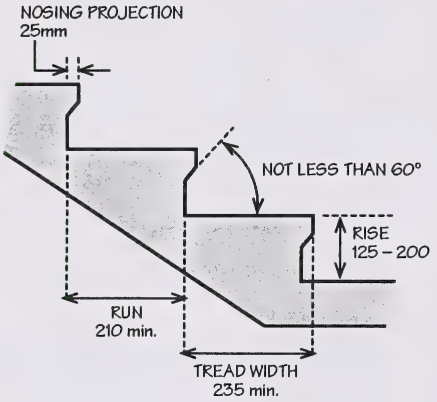
(1) . . . treads in every *exit* stair shall have a run of not less than 230mm and not more than 355mm exclusive of nosings.

(2) Stairs referred to in Sentence (1) shall have a rise between successive treads of not less than 125mm and not more than 200mm.

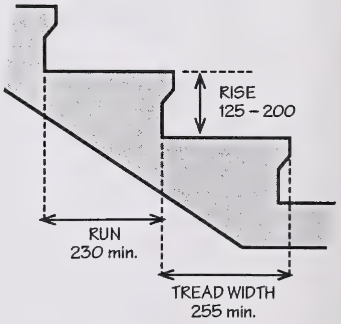
(3) Treads and risers in every *exit* stair, except a fire escape stair, shall have uniform run and rise in any one flight, and shall not alter significantly in run and rise in successive flights in any stair system.

(4) Where the run of any tread in an *exit* stair is less than 250-mm, a nosing of not less than 25mm shall be provided beyond the face of the riser, or an equivalent back slope on the riser shall be provided.

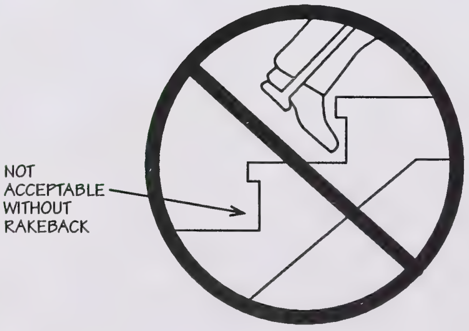
(5) The front edge of stair treads in *exits* and public *access to exits* shall be at right angles to the direction of *exit* travel.



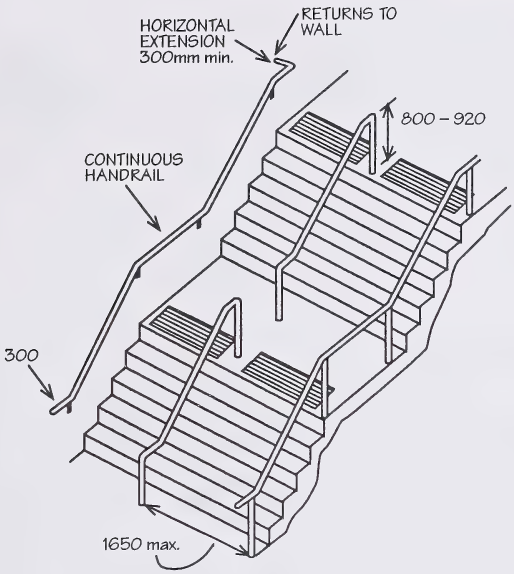
RESIDENTIAL INTERIOR & EXTERIOR STAIRS

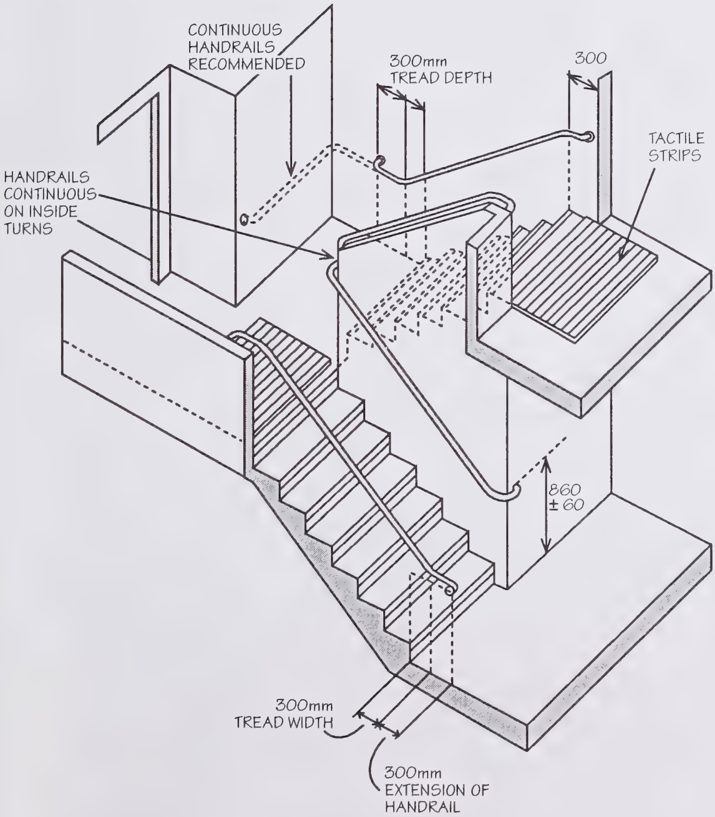


PUBLIC INTERIOR & EXTERIOR STAIRS



AVOID OPEN TREADS AND TREADS THAT ARE NOT RAKED




CONTINUOUS HANDRAILS RECOMMENDED
300mm TREAD DEPTH
300
TACTILE STRIPS
HANDRAILS CONTINUOUS ON INSIDE TURNS
860 ± 60
300mm TREAD WIDTH
300mm EXTENSION OF HANDRAIL

A comfortable stair is one that has a rise of 165mm and a tread of 300mm.

For persons in braces where a foot must be dragged up each step, "open" risers and treads with nosings that are not properly raked can cause problems and should be avoided.

Nosing of stairs should be of contrasting colour with respect to the treads and risers.

Handrails

3.4.6.4. Handrails

(1) Every *exit* ramp or stairway shall have a handrail on at least one side, and where 1100mm or more in width, shall have handrails on both sides.

(2) Where the required width of a ramp or flight of stairs is more than 2200mm, one or more intermediate handrails continuous between landings shall be provided, and the number and position of these intermediate handrails shall be such that there will be not more than 1650mm between handrails.

(3) Handrails shall be constructed so that there will be no obstruction on or above them which will break a hand hold.

(4) Handrails on stairs and ramps shall be not less than 800-mm and not more than 920-mm high, measured vertically from a line drawn through the outside edges of the stair nosing or from the surface of the ramp, except that hand-

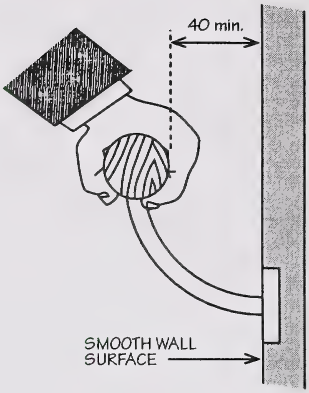
rails not meeting these requirements are permitted provided they are installed in addition to the required handrail.

(5) At least one handrail shall be continuous throughout the length of the stairway, including landings, except where interrupted by doorways or newels at changes in direction.

(6) Handrails shall be terminated in a manner which will not obstruct pedestrian travel or create a hazard.

(7) At least one handrail at the side of a stairway or ramp shall extend horizontally not less than 300mm beyond the top and bottom of the stairway or ramp.

(8) A clearance of not less than 40mm shall be provided between every handrail and any wall to which it is fastened.

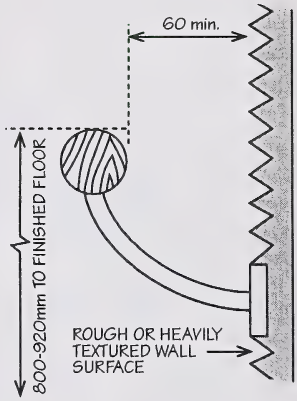


Handrails

Handrails should be easy to grasp. A circular section with a diameter of not more than 40mm is the preferred shape. Wide or deep handrails are undesirable unless a proper hand-size grasping area is provided.

Continuity of Handrail

Sentence 5 and Article 9.8.7.2. deal with continuity. Persons who are blind or visually-impaired rely on handrails to guide them on stairways. A continuous handrail is appreciated especially by the elderly.

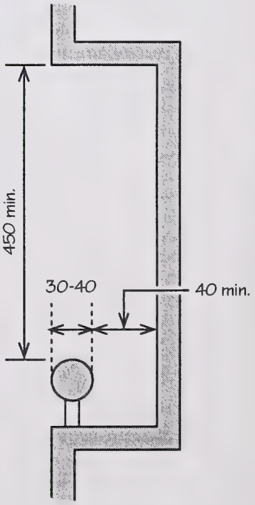

60 min.
800-920mm TO FINISHED FLOOR
ROUGH OR HEAVILY TEXTURED WALL SURFACE

9.8.7.2. Continuous Handrail.

Except for stairs serving only one *dwelling unit*, not less than one handrail shall be continuous throughout the length of the stairway, including landings, except where interrupted by doorways or newels at changes in direction.

Termination of Handrails

To assist everyone, designers should strive to provide a continuous handrail and to terminate handrails by returning the ends into the wall or downwards. This reduces the possibility of clothing catching on the ends of the handrail.



9.8.7.3.

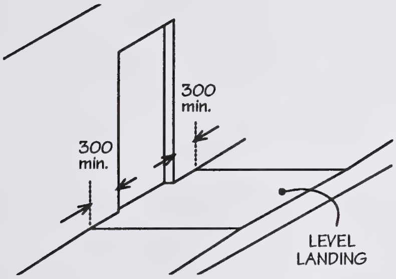
Except for stairs serving only one *dwelling unit*, handrails shall be terminated in a manner that will not obstruct pedestrian travel or create a hazard.

Handrail Extension

To assist everyone, at least one handrail is required to extend horizontally 300mm beyond the top and bottoms of stairs and ramps. The same requirement is found in Part 9 of the ABC 90.

9.8.7.4. Handrail Extension

Except for stairways serving only one *dwelling unit*, at least one handrail at the sides of a stairway or ramp shall extend horizontally not less than 300mm beyond the top and bottom of the stairway or ramp.



Clearances

The clearance between the rail and the wall must be at least 40mm. This should be increased to 60mm where a rough texture is used.

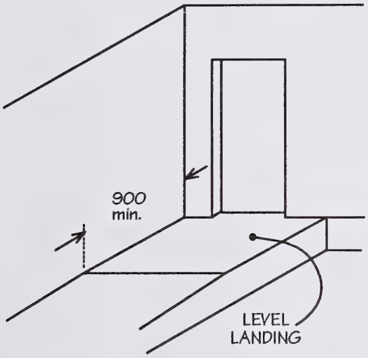
Landings

3.4.6.3. Landings and Maximum Vertical Rise of Stair Flights

(2) The length and width of landings shall be at least the width of stairways in which they occur, except that in a straight run the length of a landing need not be more than 1100mm.

(3) Where a doorway or stairway empties onto a ramp through a side wall, there shall be a level area extending across the full width of the ramp, and for a distance of 300mm on either side of the wall opening, excepting one side when it abuts on an end wall.

(4) Where a door or stairway empties through an end wall onto a ramp, there shall be a level area across the full width of the ramp and along its length for not less than 900mm.



Guards

3.4.6.5. Guards

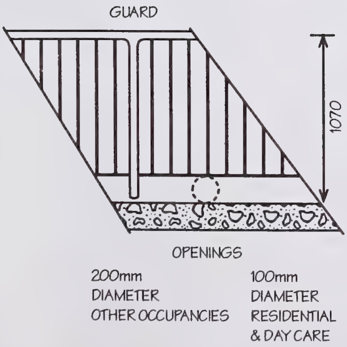
(1) Every *exit* such as a ramp, stairway or passage shall have a wall or a well-secured *guard* on each side.

(2) Except as provided in Sentence (4), the height of *guards* on *exit* stairs shall be not less than 920mm measured vertically to the top of the *guard* from a line drawn through the outside edges of the stair nosings and 1070mm around landings.

(3) The height of *guards* on *exit* ramps and their landings shall be not less than 1070mm measured vertically to the top of the *guard* from the ramp surface.

(4) The height of *guards* of exterior stairs and landings more than 10m above adjacent ground level shall not be less than 1500mm measured vertically to the top of the *guard* from a line drawn through the outside edges of the stair nosing.

(5) The size of any opening through *guards* for *exits* shall be such as to prevent the passage of a spherical object having a diameter of 100mm in *buildings* of *residential occupancy* and in day care centres, nurseries, and similar type occupancies where children may be present, and 200mm in *buildings* of other *occupancy*, except where the location and size of the openings that are more than this limit do not present a hazardous condition.



(6) Windows in *exit* stairways that extend to less than 1070mm above the landing shall be protected by a barrier or railing located approximately 1070mm above such landing.

Elevators

Elevators in the generic sense are mechanical devices for moving people from one level to another. This section deals specifically and primarily with the movement of persons in wheelchairs from one elevation to another where this can not rationally be accomplished by way of ramps. There are three standards developed by the Canadian Standards Association to evaluate elevating devices:

1. CAN/CSA-B44-M90, "Safety Code for Elevators, Escalators, Dumbwaiters, Moving Walks and Freight Platform Lifts,"
2. CAN/CSA-B355-M86, "Elevating Devices for the Handicapped," and
3. CAN/CSA-B613-M87, "Elevating Devices for the Handicapped in Private Residences."

Though the latter standard is not referenced in the Code, users of residential elevating devices should rely on the CSA certification label for peace of mind.

3.7.3.5. Elevators

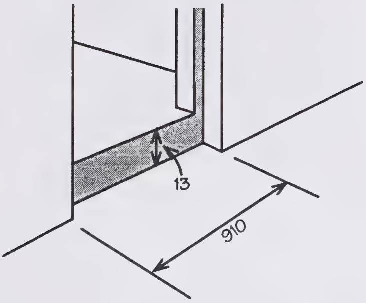
(1) Passenger elevators which are required to be *barrier-free* shall conform to Appendix E of CAN/CSA-B44-M, "Safety Code for Elevators, Escalators, Dumbwaiters, Moving Walks and Freight Platform Lifts."

(3) The passenger-type elevator referred to in Sentence (1) shall have

(a) hall or in-car audible signals that indicate at not less than 50dBA the direction the elevator is moving when it stops at a landing by sounding once for the up direction or twice for the down direction or a similar verbal annunciator acceptable to the *authority having jurisdiction*,

(b) in-car audible signals that indicate at not less than 50dBA the arrival at, or passing of, each floor, and

(c) an alarm bell button that visually indicates the operation of the alarm bell.



Appendix E of CAN/CSA B44-M

Elevator Requirements For The Handicapped

This Appendix becomes a mandatory part of the Code. It comes into force where requirements for barrier-free design are mandated and elevators are installed.

1. Operation and Levelling

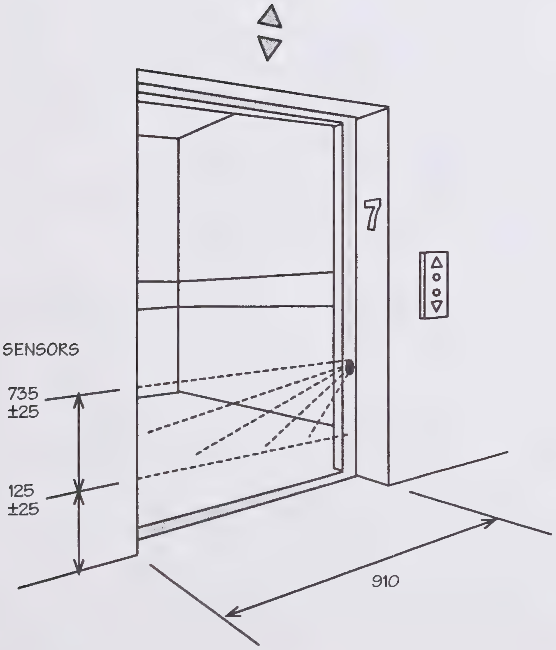
1.1 The elevator shall be automatic and be provided with a two-way automatic-maintaining levelling device to maintain the floor level to ± 13mm.

2. Door Operation

2.1 Power-operated, horizontally sliding car and landing doors opened and closed by automatic means shall be provided.

3. Door Size

3.1 The minimum clear width for elevator doors shall be 910mm.



4. Door Protective and Reopening Device

4.1 Doors shall be provided with a door-reopening device that will function to stop and reopen a car door and an adjacent landing door to at least 910mm; in case the car door is obstructed while closing. This reopening device shall also be capable of sensing an object or person in the path of a closing door at a nominal 125mm ± 25 and 735mm ± 25mm above the floor without requiring contact for activation.

4.2 Door-reopening devices shall remain effective for a period of not less than 20s.

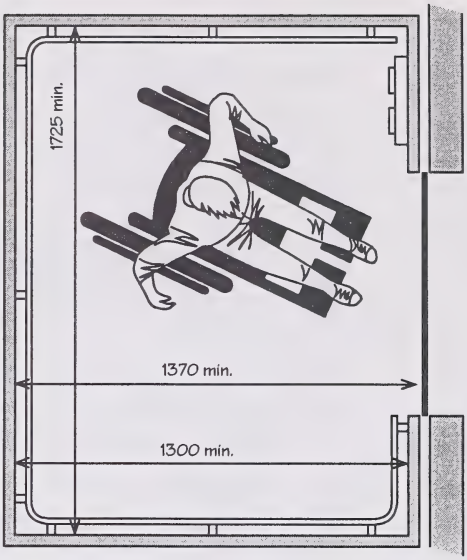
5. Door Delay (Passenger Service Time)

5.1 From the time the doors start to open, a minimum period of 4s shall elapse before the doors start to close if it is a hall call, and 3s if it is a car call. This time may be reduced after operation of the door close button.

6. Car Inside

6.1 The minimum distance between the walls or between wall and door, excluding return panels, shall be not less than 1725 and 1370mm. The minimum distance from wall to return panel shall be not less than 1300mm.

An area of 1500 x 1500mm is the preferred dimension which would allow a wheelchair to turn around with ease.



ELEVATOR CAR INSIDE DIMENSIONS

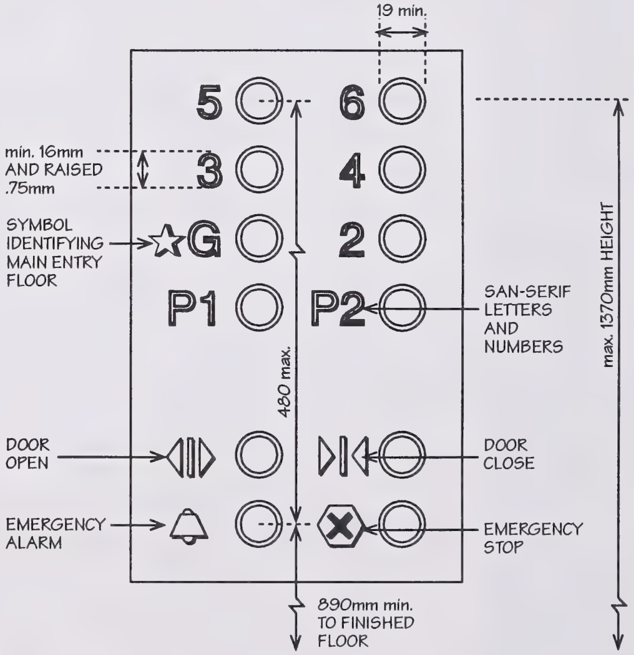
THERE SHOULD BE ENOUGH SPACE IN AN ELEVATOR CAR TO ALLOW A WHEELCHAIR TO TURN AROUND.

7. Car Controls

7.1 Controls shall be readily accessible from a wheelchair upon entering an elevator.

7.2 Emergency controls and door-operating buttons shall be grouped together at the bottom of the control panel. The centreline of the alarm button and the emergency-stop switch shall be a nominal not less than 890mm from the floor. The centreline of the highest floor button shall be no higher than 1370mm from the floor. Other controls may be located where it is convenient.

7.3 Floor registration buttons shall be a minimum 19mm in size and they may be raised, flush, or recessed. The depth of flush or recessed buttons when they are being operated shall not exceed 10mm.

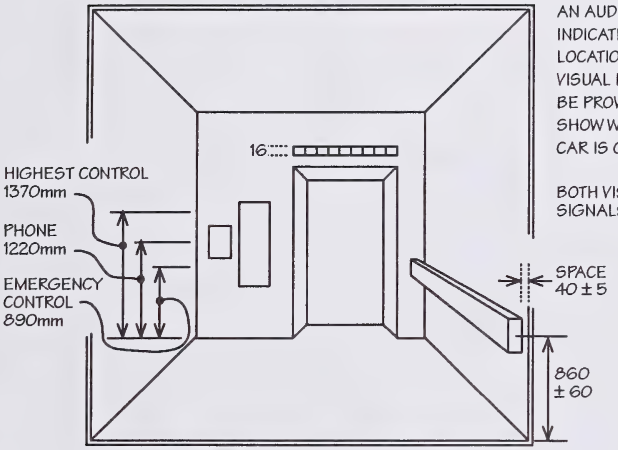

19 min.
5
6
3
4
G
2
P1
P2
min. 16mm AND RAISED .75mm
SYMBOL IDENTIFYING MAIN ENTRY FLOOR
SAN-SERIF LETTERS AND NUMBERS
480 max.
max. 1370mm HEIGHT
DOOR OPEN
DOOR CLOSE
EMERGENCY ALARM
EMERGENCY STOP
890mm min. TO FINISHED FLOOR

7.4 Arabic numerals shall be adjacent on the left of the floor buttons on a contrasting colour background. Markings shall be a minimum of 16mm high and raised a minimum of 0.75mm. Permanently attached plates are acceptable. Where the call buttons are mechanical, the raised markings may be on the buttons.

ELEVATOR

7.5 Symbols as indicated in Clause 3.6.1.10. shall be used to assist in readily identifying essential controls.

7.6 Visual and momentary audible indication shall be provided to show each call registered and visual indication shall be extinguished when the call is answered.



AN AUDIBLE SIGNAL SHALL INDICATE THE PASSING OR LOCATION OF A FLOOR. VISUAL INDICATION SHALL BE PROVIDED IN A CAR TO SHOW WHAT FLOOR THE CAR IS ON.

BOTH VISUAL AND AUDIBLE SIGNALS MUST BE USED

8. Car Position Indicator

8.1 An indicator shall be provided in the car to show the position of the car in the hoistway by illuminating the indication corresponding to the landing at which the car is stopped or passing. Indication characters shall be on a contrasting colour background and a minimum of 16mm in height.

9. Telephone

9.1 The telephone shall be located a maximum of 1220mm from the floor with a minimum cord length of 900mm.

9.2 The international symbol for telephones shall be located on the telephone cabinet in a contrasting colour. The symbol shall be a minimum of 38mm high and raised a minimum of 0.75mm. Permanently attached plates are acceptable. Telephones shall be equipped with a receiver that generates a magnetic field in the area of the receiver cap and the telephone shall have a volume control and shall comply with CSA Standard T515, “Requirements for Handsets Telephones Intended for Use by the Hard of Hearing.”

10. Floor Covering

10.1 The floor shall have a firm and slip-resistant surface that permits easy movement of wheelchairs.

11. Handrails

11.1 Handrails shall be provided at a height of 800 to 920mm with a space of 35 to 45mm between the rails and wall.

12. Illumination

12.1 The illumination at the car controls and landing sill shall be not less than 100 lx.

13. Hall Buttons

13.1 The centreline of the hall call buttons shall be 1070±25mm above the floor. Buttons shall be a minimum of 20mm in size, and shall be mounted one above the other.

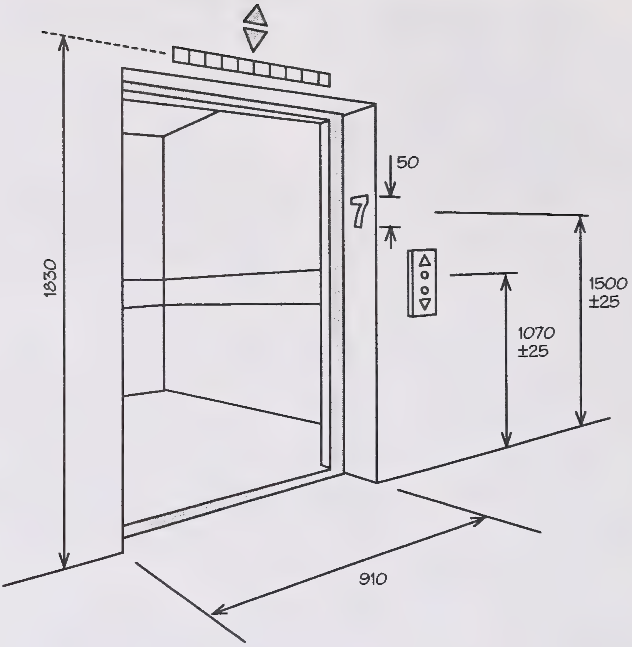
13.2 Visual indication shall be provided to show each call that is registered and that is extinguished when the call is answered.

14. Hall or In-Car Lanterns

14.1 Hall or in-car lanterns shall be provided. The centreline of the fixture shall be a minimum of 1830mm above the floor. An audible signal, shall be provided when the elevator stops at the landing. Visual elements shall be a minimum of 60mm in the smallest direction.

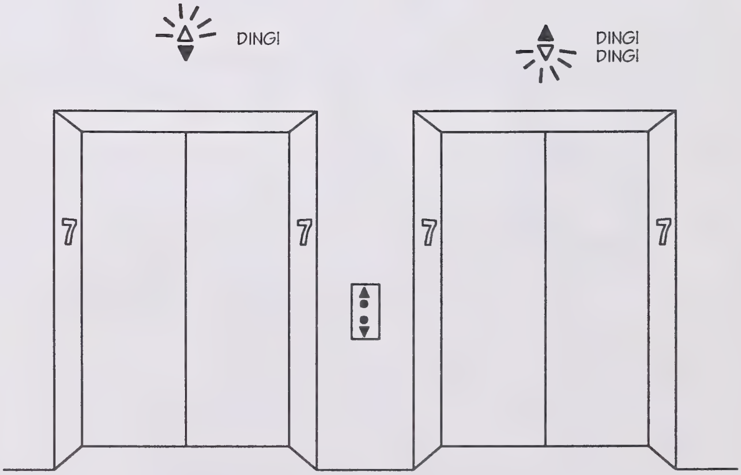
15. Floor Designations

15.1 Arabic numerals a minimum of 50mm high and raised at least 0.75mm shall be placed on both sides of the door jambs, with the centreline at 1500± 25mm above the floor to identify the floor level.



Audible Signal

Sentence 3.7.3.5. (3) is an additional requirement for elevators meeting the B-44 Standard.

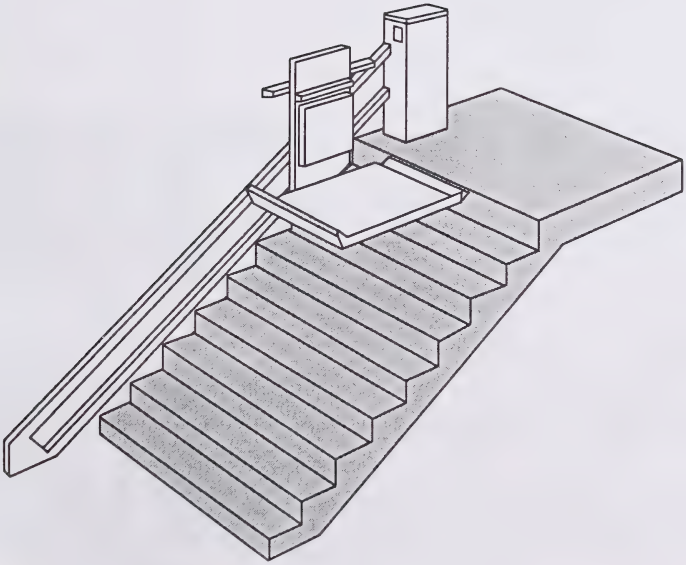


AN AUDIBLE AND VISUAL SIGNAL
SHALL INDICATE THE ARRIVAL
AND DIRECTION OF CAR MOVEMENT

Passenger Elevating Devices

3.7.3.5. Elevators

(2) The passenger elevating device referred to in Article 3.7.2.1. shall conform to CAN/CSA-B355-M, "Elevating Devices for the Handicapped."



Residential Elevating Devices
The Building Code does not regulate elevating devices for private residences; however, these should comply with CAN/CSA-B613-M87, "Elevating Devices for the Handicapped in Private Residences."

IV. PUBLIC FACILITIES

When are Washrooms required to be Barrier-Free?

3.7.2.3. Washrooms Required to be Barrier-Free

(1) Except as permitted in Sentence (2), where washrooms are provided in a *storey* to which a *barrier-free* path of travel is required in conformance with Article 3.7.2.1., these washrooms shall be *barrier-free* in conformance with the appropriate requirements in Articles 3.7.3.8. to 3.7.3.11.

(2) Washrooms need not conform to the requirements in Sentence (1) provided
   (a) they are located within *suites* of *residential occupancy*,
   (b) other *barrier-free* washrooms are provided on the same *floor area* within 45m, or
   (c) they are located in an individual *suite* having an area of less than 500m^2 in *buildings* where such *suite* is completely separated from the remainder of the *building* so that there is no access to the remainder of the *building*.

(3) In *buildings* where a washroom is required in accordance with Part7, a *barrier-free* washroom shall be provided on the entrance *storey*, except if a *barrier-free* path of travel is provided to a *barrier-free* washroom on another *storey*.

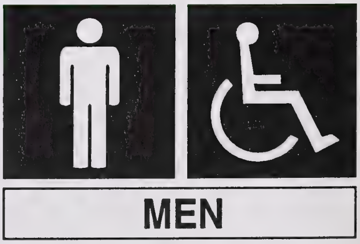
(4) Where *alterations* are made to existing *buildings*, special washrooms conforming to Article 3.7.3.11. are permitted to be provided in lieu of facilities for disabled persons in washrooms used by the general public.

(5) In addition to the requirements to Sentence (3), special washrooms conforming to Article 3.7.3.11. shall be provided in airports and train depots.

Application.
Barrier-free access must be provided to most buildings (see Article 3.7.1.1.) and to all storeys within these buildings with few exceptions. Storeys smaller than 600m^2 in area and not more than one storey above or below the entrance level need not be made barrier-free. Where washrooms are provided on these floors, they must be designed to be barrier-free unless the exceptions stated in Sentence (2) apply.

When Do Washrooms Need Not Comply?
Exceptions apply when,

- the washroom is located in a residential suite,
- other accessible washrooms are located on the same floor within 45m, or
- washrooms are provided in small shops, offices, restaurants, banks, etc. having an area of less than 500m^2 and which are part of a larger complex.



In public places where several washrooms may be provided on a large floor area, not all washrooms need to be barrier-free if certain conditions are met. A barrier-free washroom must be within a reasonable distance (45m) of a conventional washroom, and its location must be clearly marked.

Clause (c) of Sentence (2) could apply to "strip malls," (shopping malls without public corridors). Such shopping malls are composed of a number of shops, offices, agencies, banks etc. Washroom requirements apply to the building as a whole and it is important that such facilities be strategically placed to ensure a degree of control to deter vandalism. Such buildings may either provide public barrier-free washrooms in a central location or washrooms which can accommodate persons with disabilities in each suite. Central facilities relieve any one tenant from having to provide "public" washrooms. Hence, the exception for suites of less than 500m^2 is meant as a relaxation to avoid an unnecessary burden on small facilities, but should not be construed as meaning that such buildings need not provide accessible washrooms.

All Buildings

Sentence (3) requires that in all buildings abutting a public water system, a barrier-free washroom be provided on the entry level unless other provisions are made for such facilities on another floor.

Renovations

The Alberta Building Code applies to the parts of buildings being renovated. The Code allows the use of special washrooms to meet these requirements. A special washroom is a self contained facility which can be used by either sex. Special washrooms allow a person with a disability and an attendant, if required, to use the facility in private. This option would allow existing washrooms to be renovated without major alterations to the roughed-in plumbing, and an additional washroom to serve persons in wheelchairs built apart from the main facility.

Airports and Train Depots

Often persons that are young, disabled or old require the help of an adult, attendant or companion to help them take care of themselves, especially before or after a long trip. Special washrooms allow for this flexibility with a certain appreciated privacy.

Self Contained Washrooms

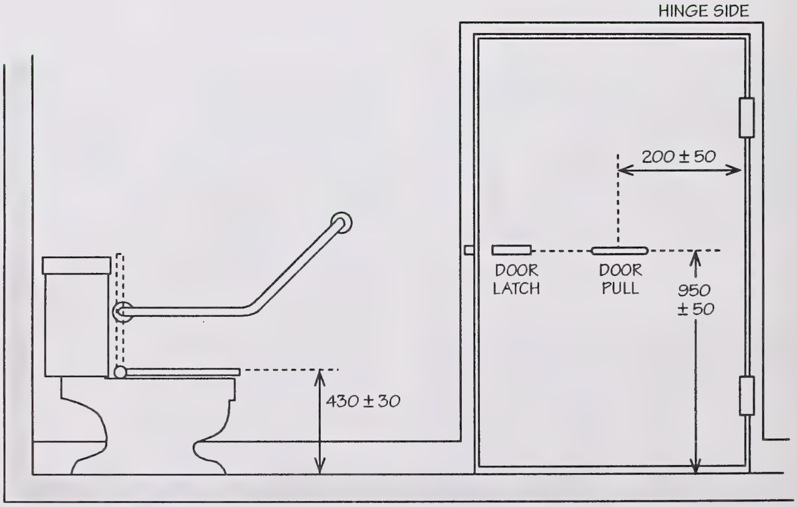
3.7.3.11. Special Washrooms

(1) In existing *buildings* where special washrooms are intended to be provided, such washrooms shall

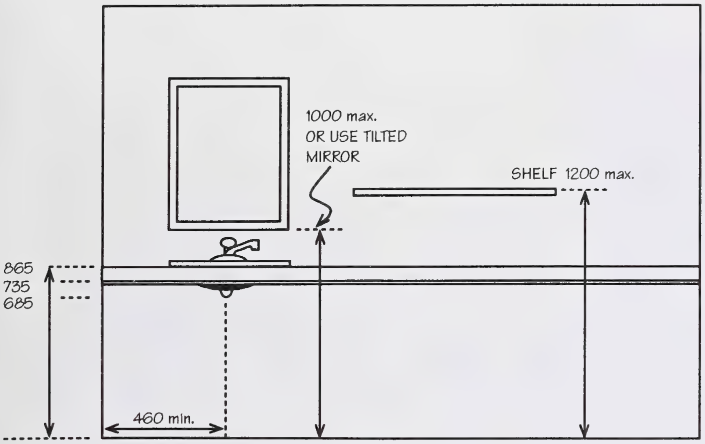
- (a) be equipped with a door capable of being locked from the inside and released from the outside in case of emergency and which has,
  - (i) graspable latch operating and locking mechanisms located between 900 and 1000mm from the floor,
  - (ii) on outward swinging doors, a door pull not less than 140mm in length located on the inside so that its midpoint is between 200 and 300mm from the hinged side of the door and between 900 and 1000mm from the floor.
- (b) be provided with a lavatory conforming to Article 3.7.3.10,
- (c) be equipped with a water closet conforming to Article 3.7.3.9.,
- (d) be equipped with grab bars conforming the Clause 3.7.3.8.(1)(d),
- (e) have an overall width and length not less than 1700mm;
- (f) have fixture clearances conforming to the fixture clearances described in Articles 3.7.3.8. to 3.7.3.10.,
- (g) be equipped with a coat hook conforming to Clause 3.7.3.8.(1)(e) and a shelf located not more than 1200mm above the floor, and
- (h) have a doorway conforming to Article 3.7.3.3.

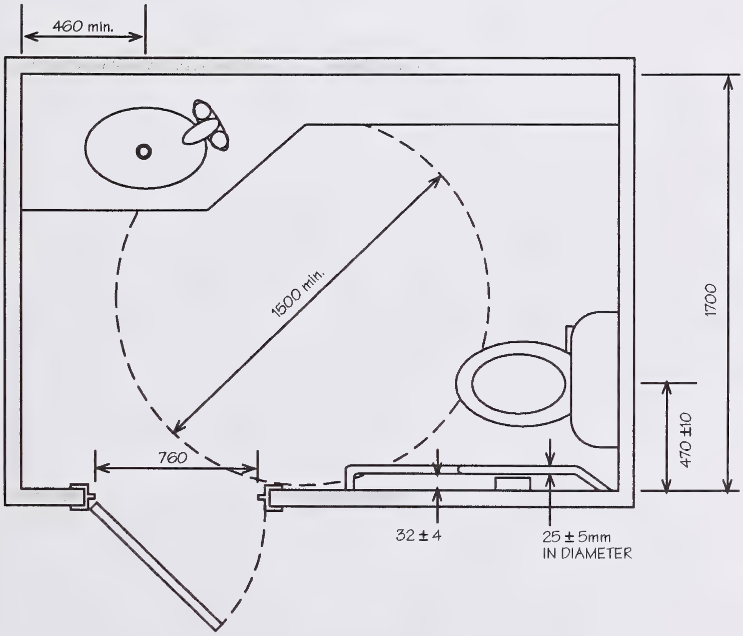
Special Facilities
Unobstructed areas in front of the lavatory, in front of the water closet and to one side are necessary for maneuverability of a wheelchair.

Special washrooms are intended for use primarily by persons in



wheelchairs who require assistance by an attendant. These facilities serve both sexes and are designed to provide a greater degree of privacy especially where the attendant is of the opposite sex to that of the person needing help. Special washrooms may also serve parents with small children. Special washrooms should not be used as a substitute for making regular washrooms accessible.

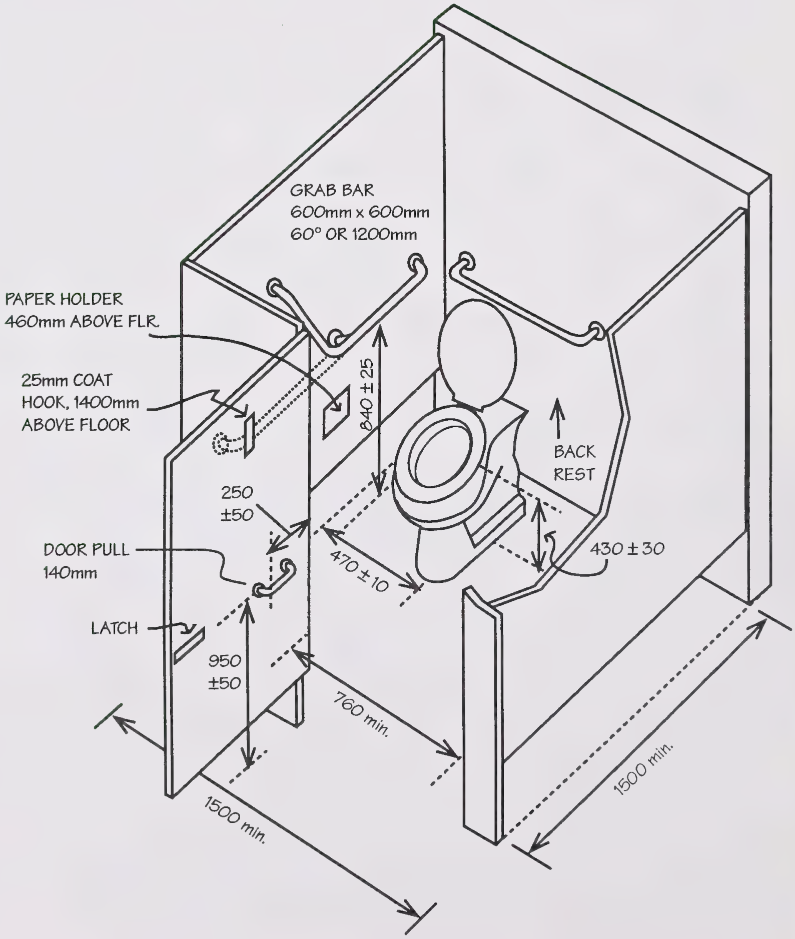




Water Closet Stalls

3.7.3.8. Water Closet Stalls

(1) Where a washroom is required by Article 3.7.2.3. to be *barrier-free*, at least one water closet stall or enclosure shall
  - (a) be not less than 1500mm in width by 1500mm in depth,
  - (b) be equipped with a door which shall
    - (i) be capable of being locked from the inside,
    - (ii) provide a clear opening of not less than 760mm with the door in the open position,
    - (iii) swing outward, unless sufficient room is provided within the stall or enclosure to permit the door to be closed without interfering with the wheelchair,
    - (iv) be provided on the inside with a door pull not less than 140mm in length located so that its midpoint is between 200mm and 300mm from the hinged side of the door and between 900mm and 1000mm from the floor, and
    - (v) be provided with a door pull on the outside, near the latch side of the door,
  - (c) have a water closet located so that its centreline is not less than 460mm and not more than 480mm from an adjacent side wall on one side,
  - (d) be equipped with grab bars as described in Sentence (2),
  - (e) be equipped with a coat hook mounted not more than 1400mm above the floor on a side wall and projecting not more than 25mm from the wall,
  - (f) have a clearance of not

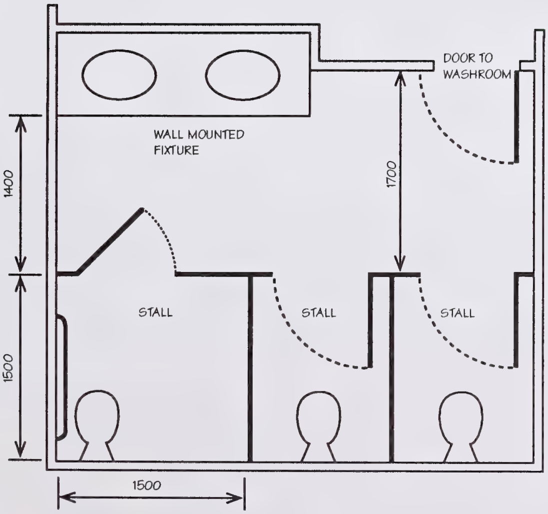


less than 1700mm between the outside of the stall face and the face of an in-swinging washroom door and 1400mm between the outside of the stall face and any wall-mounted fixture, and

(g) have ancillary items such as a toilet paper dispenser located on the wall nearest to the water closet below the grab bar, not less than 460mm above the floor, and within easy reach of a person seated on the water closet.

(2) A grab bar required in Sentence (1) shall

- (a) be mounted horizontally on the wall behind the water closet so that it extends the full width of the water closet bowl if the water closet does not have a tank, and
- (b) be mounted,
  - (i) horizontally on the wall beside the water closet, and be not less than 1200mm in length, located with its centreline between 815mm and 865mm above the floor and with its midpoint located in line with the front edge of the water closet, or
  - (ii) be mounted on the wall beside the water closet and have a horizontal portion 600mm in length with a 600mm extension extending upwards to the front and away from the horizontal portion at an angle of 60° to the horizontal with the centreline of the horizontal portion between 815mm and 865mm above the floor and the intersection of the horizontal and sloping portions located in line with the front edge of the water closet.



(3) A grab bar described in Sentence (2) shall

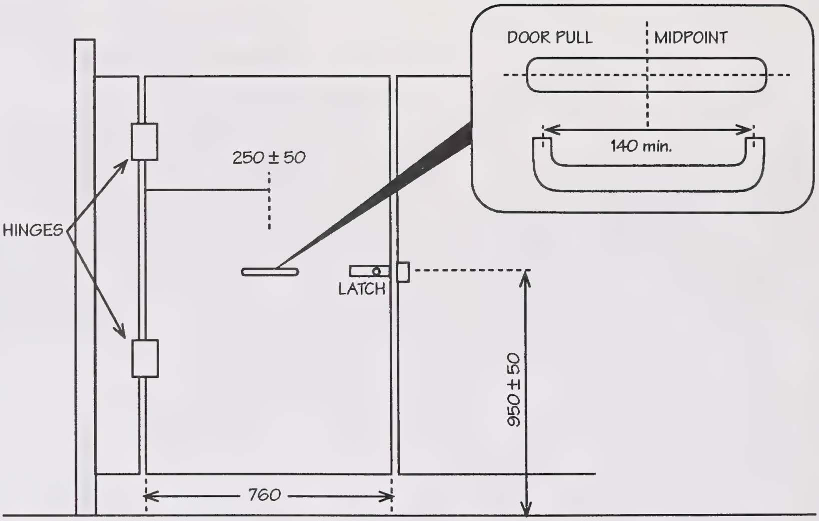
- (a) be installed to resist a load of not less than 1.3kN applied vertically or horizontally,
- (b) be not less than 30mm and not more than 40mm in diameter, and
- (c) have a clearance of 35 to 45mm from the wall.

Stall Doors

Where doors to water closet stalls swing outward, it is preferred that they swing against a side wall.

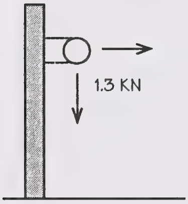
Door Pulls

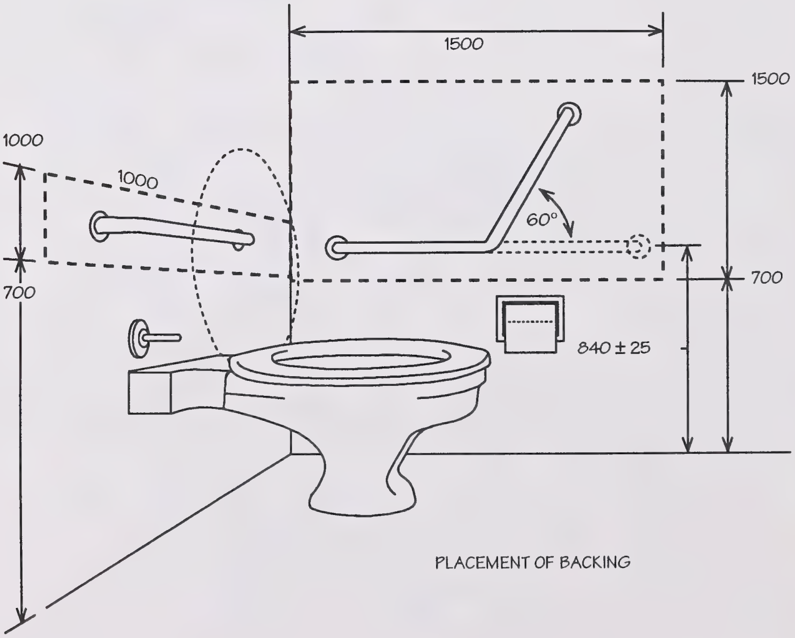
The door pull should consist of a D-shaped handle mounted either horizontally or vertically. Lines drawn through the long axis and short axis of the handle would intersect at the mid point (See diagram). The mid point should be located not less than 200mm or not more than 300mm from the edge of the door on the hinged side, and not more than 1000mm or not less than 900-mm from the floor.



Backing for Grab Bars

Sufficient backing is required for the installation of grab bars. This is best if taken care of during the rough-in stage of construction. Grab bars must resist a load of 1.3 kN applied vertically or horizontally.



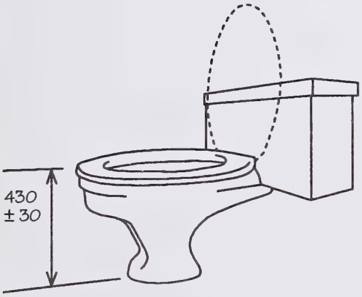


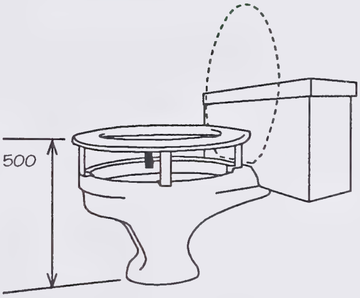
PLACEMENT OF BACKING

Water Closets and Urinals

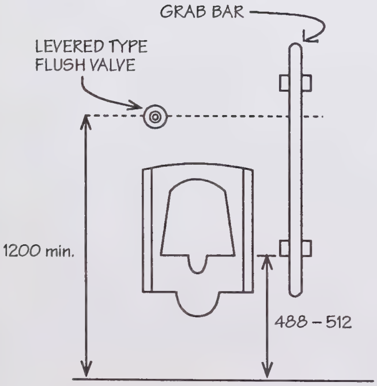
3.7.3.9. Water Closets and Urinals

(1) Water closets for disabled persons shall
  (a) be equipped with seats located at not less than 400mm and not more than 460mm above the floor,
  (b) be equipped with hand-operated flushing controls that are easily accessible to a wheelchair user,
  (c) be equipped with a back support such as a seat lid, and
  (d) not have a spring-actuated seat.
(2) If urinals are provided in a washroom required by Sentence 3.7.2.3.(1) to accommodate disabled persons, at least one urinal shall be either
  (a) wall mounted with the opening of the basin between 488mm and 512mm above the finished floor, or
  (b) floor mounted at the same level as the finished floor with no step being permitted in front of either type of urinal and a vertically mounted grab bar shall be installed on the wall beside the urinal.





WITH EXTENSION FOR ELDERLY



Water Closets

Wall-mounted water closets or floor models with recessed bases are preferable because they provide the least amount of obstruction. To ease transfer from a wheelchair, the toilet seat should be the same height as the chair seat; that is between 400 and 460mm. Older persons often have difficulty getting up from a sitting position, so toilet seats located 500mm from the floor are sometimes preferred.

Urinals

A clear floor space shall be provided in front of urinals to allow a forward approach. Privacy shields should not extend beyond the front edge of the urinal rim. Flush controls should be lever-operated or automatic.

Lavatories

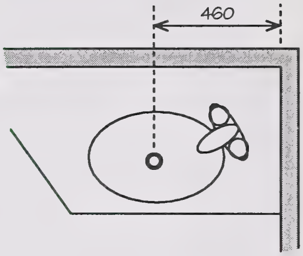
3.7.3.10. Lavatories

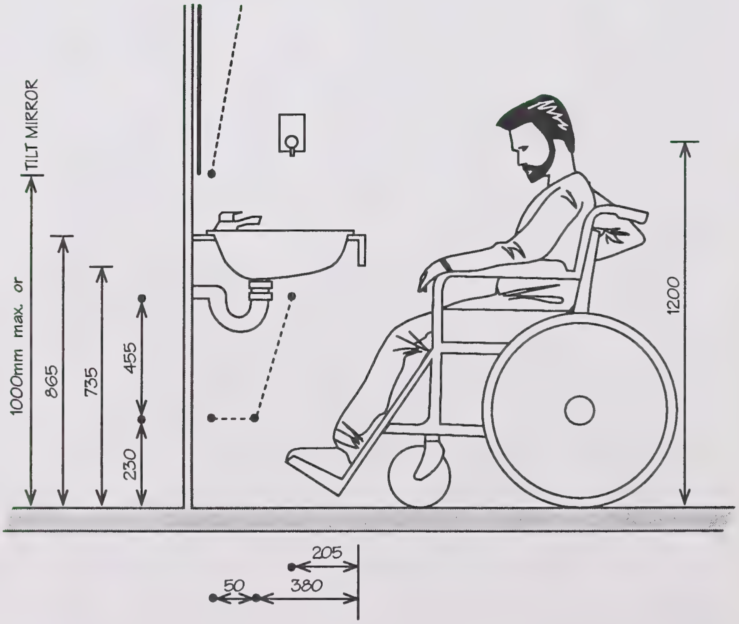
(1) *Barrier-free* washrooms shall be provided with a lavatory which shall
  (a) be located so that the distance between the centreline of the fixture and the side wall is not less than 460mm,
  (b) have a top surface height of not more than 865mm,
  (c) have a clearance beneath of not less than
    (i) 735mm at the front edge of the lavatory,
    (ii) 685mm at a point 205mm back from the front edge, and
    (iii) 230mm over the distance from a point 280mm to a point 430mm back from the front edge,
  (d) have insulated waste pipes and hot water supply pipes where these pipes present a burn hazard,
  (e) be equipped with faucet handles of the lever type without spring loading, and
  (f) have washroom accessories, such as soap and towel dispensers, located not more than 1200mm above the floor in an area that is accessible to persons in wheelchairs.

(2) Shelves or other projections above or adjacent to lavatories shall be located so they will not present a hazard to visually impaired persons.

(3) If mirrors are provided in a washroom required to accommodate physically disabled persons, at least one mirror shall be mounted with its bottom edge not more than 1000mm above the finished floor, or shall be tilted to be usable by a person in a wheelchair.

(4) In a washroom required to accommodate physically disabled persons, washroom accessories shall be available that are of a type, and are installed, so as to be usable by a person in a wheelchair and shall be not more than 1200mm from the finished floor to the operating part.

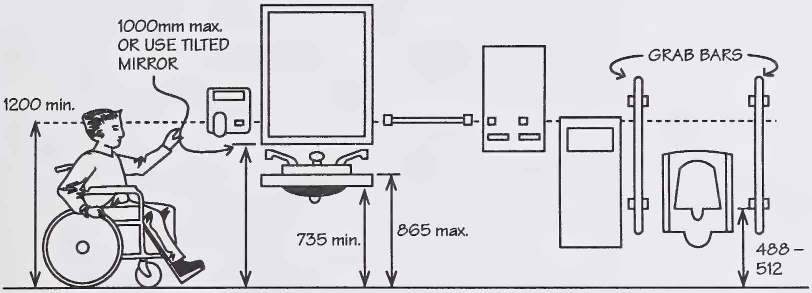




Protection from Burns

Hot water and drain pipes under lavatories must be insulated or otherwise protected where they can be a burn hazard to persons in wheelchairs. Article 7.2.3.1. requires water to be heated in the range of 45° and 60°C.

Faucets
Automatic water controls are an acceptable alternative to levered-handle faucets.



Washroom Accessories

7.2.1.13. Protruding Hazards

All ancillary items in a washroom, including towel dispensers and hand dryers, shall be installed so that they do not create a hazard for a visually impaired person.

Colour contrasting these items to the surfaces they are attached to will also assist persons with visual impairments identify them.

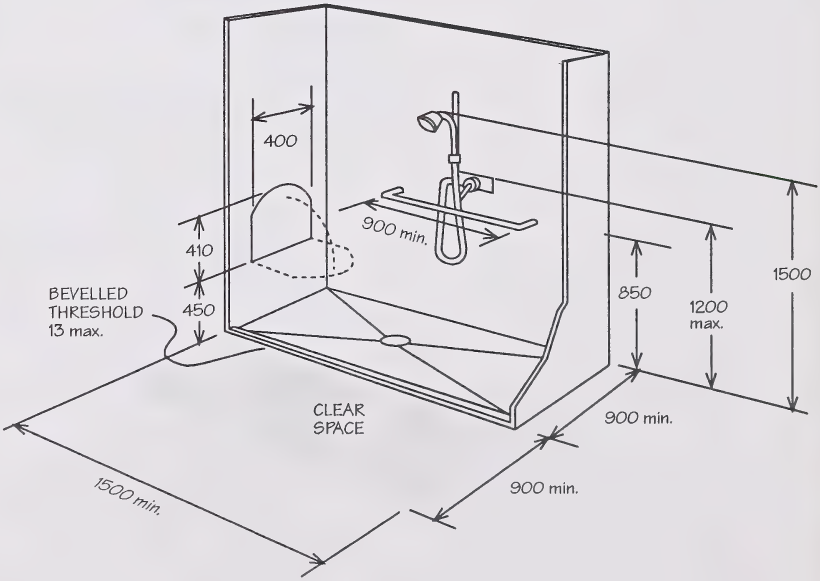
Shower Stalls

3.7.3.12. Showers

(1) Where showers are provided in *buildings* of *assembly occupancy*, at least one shower stall shall be *barrier-free* and shall
  (a) be not less than 1500mm in width and 900mm in depth,
  (b) have a clear floor space at the entrance to the shower of not less than 900mm in depth and the same width as the shower, except that fixtures are permitted to project into that space provided they do not restrict access to the shower,
  (c) have a slip-resistant floor surface,
  (d) have a bevelled threshold not exceeding 13mm in height above the finished floor,
  (e) be equipped with a hinged seat that is not spring-loaded or a fixed seat that is,
    (i) not less than 450mm in width and 400mm in depth,
    (ii) mounted approximately 450mm above the floor, and
    (iii) designed to carry a minimum load of 1.3kN,
  (f) be equipped with a horizontal grab bar which shall
    (i) be not less than 900mm in length,
    (ii) be mounted approximately 850mm above the floor,
    (iii) located on the wall opposite the entrance to the shower so that not less than 300mm of its length is at one side of the seat, and
    (iv) conform to Sentence 3.7.3.8.(3),

(g) be equipped with a pressure-equalizing or thermostatic mixing valve controlled by lever or other device operable with a closed fist from the seated position,
(h) be equipped with a hand-held shower head with not less than 1500mm of flexible hose located so that it can be reached from the seated position and equipped with a support so that it can operate as a fixed shower head or a fixed head mounted at a height of 1500mm, and
(i) have fully recessed soap holders which can be reached from the seated position.

In assembly buildings such as schools, colleges and community halls, where individual showers are provided, at least one shower stall is required. In the above-mentioned buildings, at least one change cubicle should be provided for each sex to accommodate disabled persons.



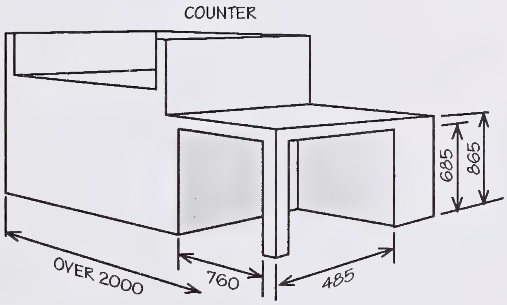
The inside measurements of the shower stall shall be at least 900 by 1500mm with a slip-resistant floor finish and have a bevelled threshold of not more than 13mm.

Clear Space at Entrances to Showers

The clear space at the entrance to a shower may be encroached upon by fixtures such as a wall-hung sink which does not interfere with the leg rests of the wheelchair. However, this sink should not restrict movement for persons who need to make a lateral transfer.

Shower Stalls and Grab Bars

Only one grab bar is required and must be installed on the wall next to the seat; a grab bar behind the seat might prevent the user from leaning back against the wall, while one located on the wall opposite the



seat cannot be reached from a wheelchair. The seat itself may be used in conjunction with the bar for transfer.

The shower stall shall be equipped with a hinged seat, grab bar, pressure-balancing single lever control and a hand-held shower head with flexible hose. (Where vandalism is a problem, the use of a fixed head is acceptable).

Counters

3.7.3.13. Counters

(1) All counters more than 2m long serving the public shall have at least one *barrier-free* section in conformance with Sentences (2) and (3).

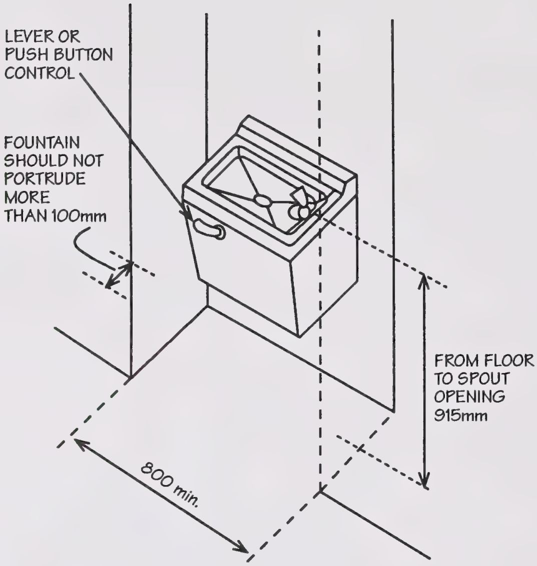
(2) *Barrier-free* counter surfaces shall be not more than 865mm above the floor.

(3) Knee space beneath *barrier-free* counters intended to be used as work surfaces shall be not less than,
  (a) 760mm wide,
  (b) 685mm high, and
  (c) 485mm deep.

Drinking Fountains

3.7.3.15. Drinking Fountains

(1) Where drinking fountains are provided, at least one shall be *barrier-free* and shall
   (a) have a spout located near the front of the unit not more than 915mm above the floor, and
   (b) be equipped with controls that are easily operable from a wheelchair using one hand with a force of not more than 22N.


LEVER OR PUSH BUTTON CONTROL
FOUNTAIN SHOULD NOT PORTRUDE MORE THAN 100mm
FROM FLOOR TO SPOUT OPENING 915mm
800 min.

Commercially available drinking fountains having two spouts at varying heights are ideally suited both for people in wheelchairs and people who find it difficult and awkward to bend down. One spout must be not more than 915mm high. The recommended height for the higher spout is 1050mm measured from the floor.

Seating at Performances and Sports Events

3.7.2.1. Areas Requiring Barrier-Free Access

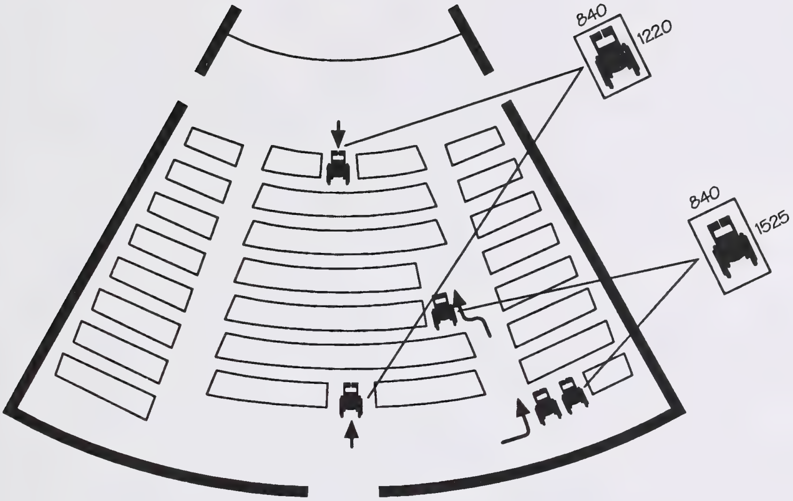
(1) . . . , a *barrier-free* path of travel shall be provided
   (b) into rooms or areas that serve the public or are designated for use by visitors, including areas in *assembly occupancies* with fixed seats, display areas and merchandising departments,

3.7.2.2. Seating.

The number of spaces designated for wheelchair use in Clause 3.7.2.1.(1)(b) shall be one space for every 125 seats or part thereof.

Numbers Required and Location

In assembly occupancies with fixed seats, one space designated for wheelchair use shall be provided for every 125 seats. For a seating capacity of 126 to 250, two spaces are required and so on. These spaces must be scattered throughout the seating area to allow a choice of locations.



3.7.3.6. Spaces In Seating Area

(1) Spaces designated for wheelchair use in Article 3.7.2.1. shall be
  (a) clear and level, or level with removable seats,
  (b) not less than 840mm wide and 1525mm long to permit wheelchairs to enter from a side approach and 1220mm long where the wheelchair enters from the front or rear to the space,
  (c) arranged so that at least two designated spaces are side by side,
  (d) located adjoining a *barrier-free* path of travel without infringing on egress from any row of seating or any aisle requirements, and
  (e) situated, as part of the designated seating plan, to provide a choice of viewing location.

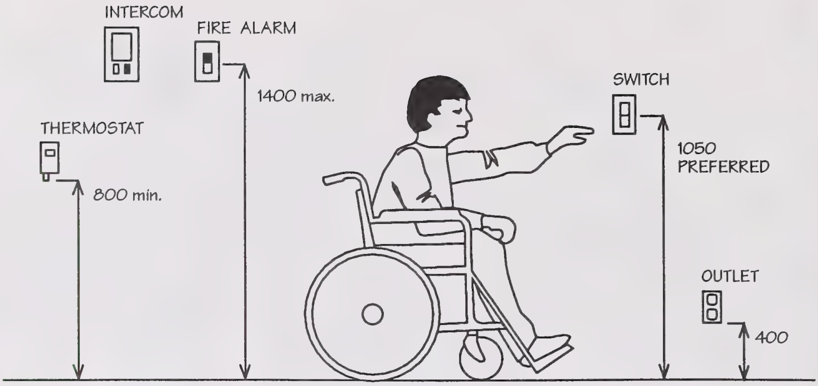
Design Requirements
Wheelchairs will take up more space than normal seating.

According to Sentance 3.7.3.4. (2), handrails are not required for ramped aisleways serving fixed seats in assembley occupations.

Location of Controls

3.7.1.5. Controls

Except as provided in Article 3.7.3.5. for elevators, controls for the operation of *building* services or safety devices located in a *barrier-free* path of travel and intended to be operated by an occupant, including electrical switches, thermostats and intercom switches, shall be accessible to a person in a wheelchair and shall be mounted not more than 1400mm above the floor.



Building Controls

Pull stations, electric switches, thermostats, intercom controls, telephones or other controls for the operation of building services shall be accessible to a person in a wheelchair. These controls are best located no higher than 1050mm and no lower than 800mm above the floor. Electrical outlets are preferably placed 500mm above the floor.

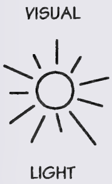
Building controls should be easy to find and contrast with the background for ease of identification, especially by persons with impaired vision.

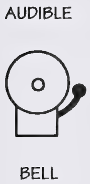
V. COMMUNICATION

General Rule

In general, wherever an audible signal is used, a visual signal (created by a light, one preferably that flashes on and off) shall also be used. This need not be a strobe light.

Fire Alarms





3.2.4.18. Alert and Alarm Signals

(5) In a *building* or portion thereof intended for use primarily by persons with hearing impairments and in *buildings* required to be *barrier-free*, visual signal appliances shall be installed in addition to audible signal appliances.

3.2.4.19. Audibility of Alarm Systems

(1) Audible signal appliances forming part of a required fire alarm system shall be installed in a *building* so that *alert signals, alarm signals* and voice messages can be heard intelligibly throughout the *floor area* in which they are installed.

(2) If a fire alarm system is required, audible signal appliances shall be located in a *service space* referred to in Sentence 3.2.1.1.(7) and shall be connected to the fire alarm system.

Placement of Bells and Lights

Fire alarms must be audible in all areas of a building including service areas such as mechanical penthouses and interstitial spaces. Walls separating suites are designed and better constructed for sound attenuation. To compensate for the intervening walls, designers are now locating fire alarm bells in individual suites rather than increasing the size of the alarm bells in corridors.

3.2.4.20. Visual Signals

(1) Visual signal appliances shall conform to CAN/ULC S526, "Standard for Visual Signal Appliances."

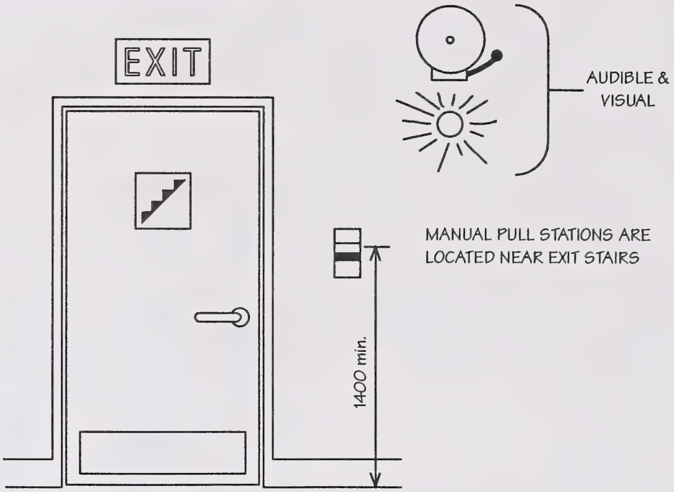
(2) Visual signal appliances required in a *building* or portion thereof intended for use primarily by persons with hearing impairments shall be installed so that the signal from not less than one appliance is visible throughout the *floor area* or portion thereof in which they are installed.

(3) In *buildings* required to be *barrier-free*, a visual signal appliance shall be installed in close proximity to each required audible signal appliance.

Adaptation for the Deaf

In facilities designed primarily for persons who are deaf, audible signals, unless they can generate enough vibrations, are of no use to the occupants. In this situation, visual signals must be strategically placed to be seen in all areas. Vibrating devices are also used especially to wake a person from sleep.

Audible/Visual Signals
In buildings required to be barrier-free and not designed specifically for persons who are deaf, visual signals need only be placed in close proximity to the fire alarm bells.

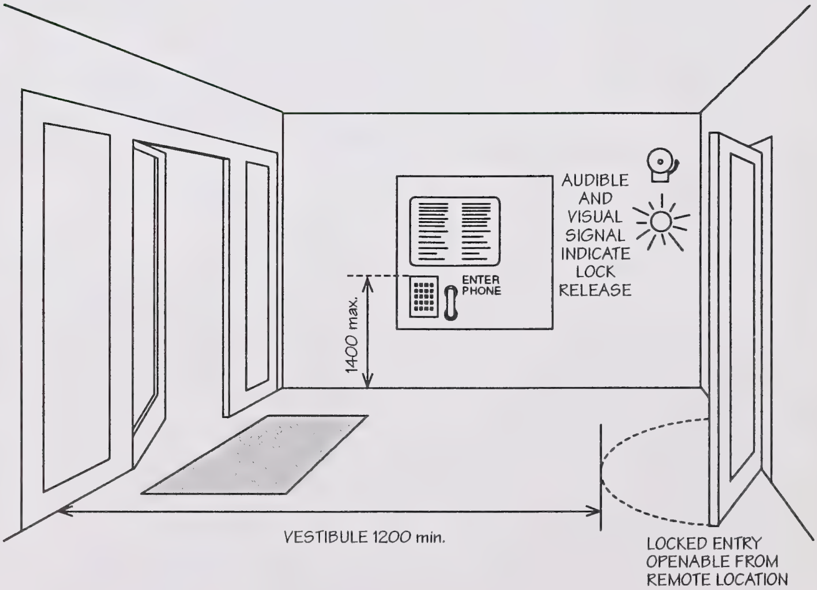


Entrance Security System

3.7.1.2. Entrances

(3) Where entrances are equipped with security systems, both visual and audible signals shall be used to indicate when the door lock is released.

Alerting Signals
Entrances equipped with electromagnetic locks as part of a security system can create a difficulty for persons with hearing loss. Some entrances in walk-up apartments, for example, have security locks that are released from a remote location, such as a tenant's suite. Barrier-free design requires that both an audible and visual signal be provided to alert visitors that the locking mechanism it deactivated.

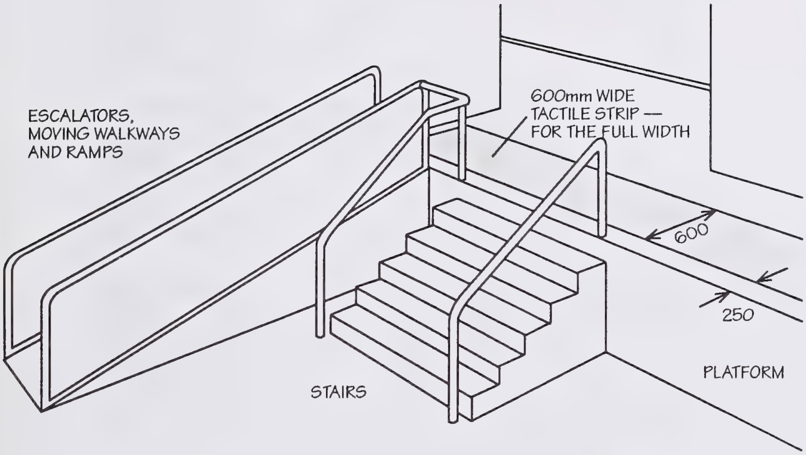

AUDIBLE AND VISUAL SIGNAL INDICATE LOCK RELEASE
ENTER PHONE
1400 max.
VESTIBULE 1200 min.
LOCKED ENTRY OPENABLE FROM REMOTE LOCATION

Tactile Warning Signals

Highway designers have for some time used, closely spaced, raised strips across the highway to alert drivers of a change in road conditions. Similarly we use embossed surfaces to warn persons who are visually impaired of a change in condition.

3.3.1.7. Protection On Floor Areas With A Barrier-free Path Of Travel

(2) In a *barrier-free* path of travel a downward change in elevation shall be signalled by the use of a 600mm wide tactile warning strip placed 250mm from the edge and for the full width of a stair, escalator, moving walkway, ramp or platform and identified using colour and brightness contrast.


ESCALATORS, MOVING WALKWAYS AND RAMPS
600mm WIDE TACTILE STRIP — FOR THE FULL WIDTH
600
250
STAIRS
PLATFORM

To assist persons with visual impairment, colour contrast tactile warning strips must be used at the top of an escalator, a ramp, moving walkway, a stairway or at the edge of a platform not served by handrails or guards as would be the case with Transit Stations.

The required tactile warning strip shall begin 850mm back from the edge in question and for its full width. It should feel noticeably different when walked on, and be in a contrasting colour to the surrounding flooring. It should not cause someone to stumble.

Doors to stairwells that are properly identified with tactile signs also serve as a warning of a downward change in direction.

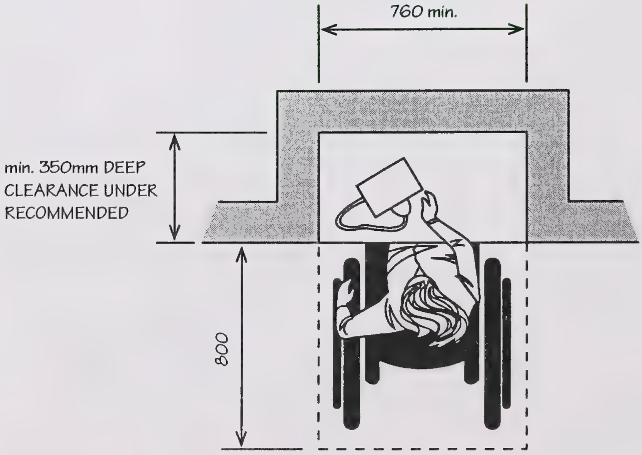
Public Telephones

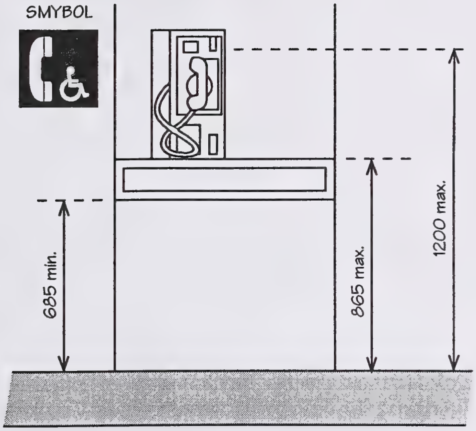
3.7.3.14. Shelves, Counters and Telephone Equipment

(1) Where built-in shelves or counters are provided for public telephones, they shall be level and shall
  (a) be not less than 350mm deep, and
  (b) have, for each telephone provided, a clear space not less than 250mm wide having no obstruction within 250mm above the surface.
(2) The top surface of a section of the shelf or counter described in Sentence (1) serving at least one telephone shall be not more than 865mm above the floor.
(3) Where a wall-hung telephone is provided above the shelf or counter section described in Sentence (2), it shall be located so that the receiver, coin slot and controls are not more than 1200-mm above the floor.
(4) Where public telephones are provided, at least one telephone shall be provided with a variable volume control on the receiver.
(5) Where public telephones are provided in entrance foyers of *buildings* classified as Group A (assembly), Group B Division 1 (detention centres), hospitals in Group B Division 2, Police stations in Group D, or Group E (shopping centres), or in lobbies of hotels and motels, at least one telephone shall be provided with a built-in telecommunication device for the deaf (TDD).

Telephone Service

An area of 1500x1500mm is required to provide space for maneuvering a wheelchair in front of public phones to make them accessible for persons in wheelchairs. Coin slots and other features must be within reach of a person sitting in a wheelchair. These must not be any higher than 1200mm above the floor. In order to accommodate an ambulatory person, a fold down seat should be provided. To add flexibility, a space on a shelf or counter is required for the setting down of a portable Telecommunication Device for the Deaf (TDD), or a computer. This space must be 350mm deep, 250mm





wide, have a 250mm clearance above it and be located no more than 865mm above the floor.

Telecommunication Devices for the Deaf (TDD) provide a screen and a keyboard for transmitting visual messages. There are two types of devices: portable devices which can be used with any phone and devices which are built into the base of public telephones. Such phones are expensive and must be placed in areas that are supervised. In large complexes, such as a shopping malls, where more than one bank of pay phones is provided, signs should indicate the location of TDD.

Assistive Listening Devices

3.7.3.7. Assistive Listening Devices

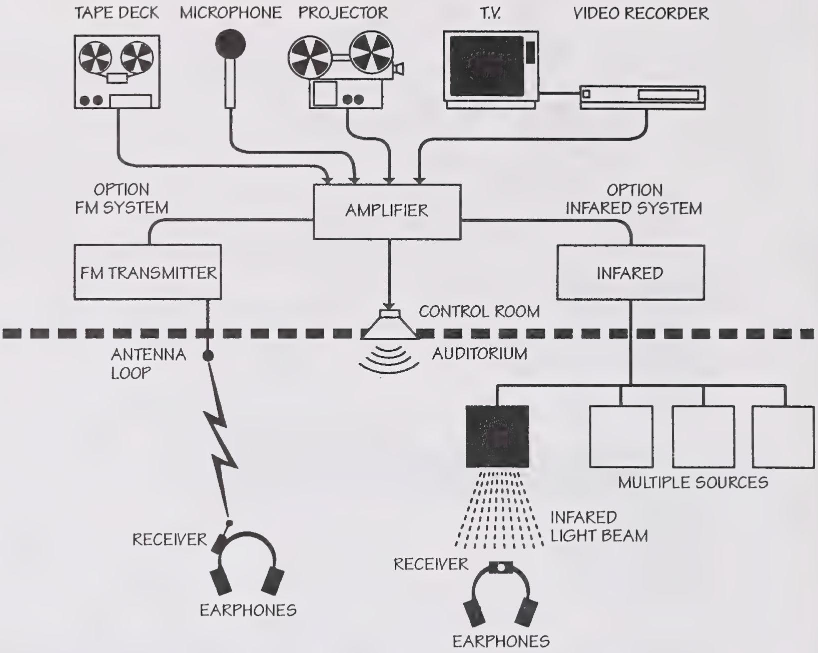
(1) Except as permitted in Sentence (2), in *buildings* of *assembly occupancy*, all classrooms, auditoria, meeting rooms and *theatres* with an area of more than 100 m^2 shall be equipped with an assistive listening system encompassing the entire seating area.

(2) Where the assistive listening system required in Sentence (1) is an induction loop system, only half the seating area in the room need be encompassed.

Assistive Listening Systems

Wireless sound transmission systems, such as FM, infrared or magnetic induction loop, improve sound reception for persons who are hard of hearing by providing amplification which can be adjusted by each user. These systems block out unwanted background noise. They transmit a signal that is picked up by special receivers which are worn by the audience, whether or not they use a hearing aid. Neither systems interfere with the listening enjoyment of others.

The induction loop system requires users to sit in the area circumscribed by the loop. Though installation of the loop is relatively simple, the installer should be knowledgeable about these systems if proper functioning is to be achieved. FM or infrared systems can be designed to broadcast signals which cover the entire room, and thus do not restrict seating to any one area. The diagram shows the general configuration of FM and infrared systems. The transmitter for these wireless systems can be interconnected with the existing sound system amplifier or used independently with separate microphones. Generally, the systems installed in church halls, auditoria, theatres and similar places of assembly are not portable; they are installed as part of the fixed sound system for the facility.



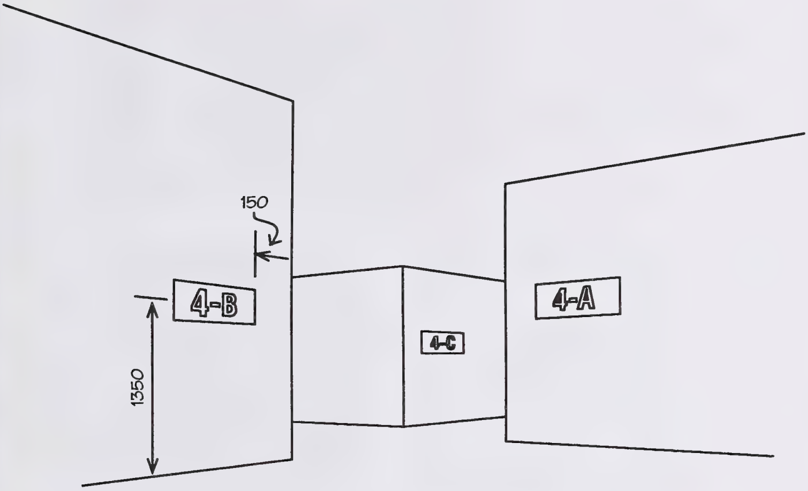
Hard-wired systems (where a jack is provided at a particular seat) will require special individual volume control provisions to accommodate persons with varying degrees of hearing impairment. In choosing the most appropriate system, a number of factors must be taken into account including cost, installation and maintenance, suitability to the audience, ease of operation and the need for privacy. Information on designers and suppliers of these systems may be obtained from such organizations as the Canadian Hearing Society or the Canadian Co-ordinating Council of Deafness.

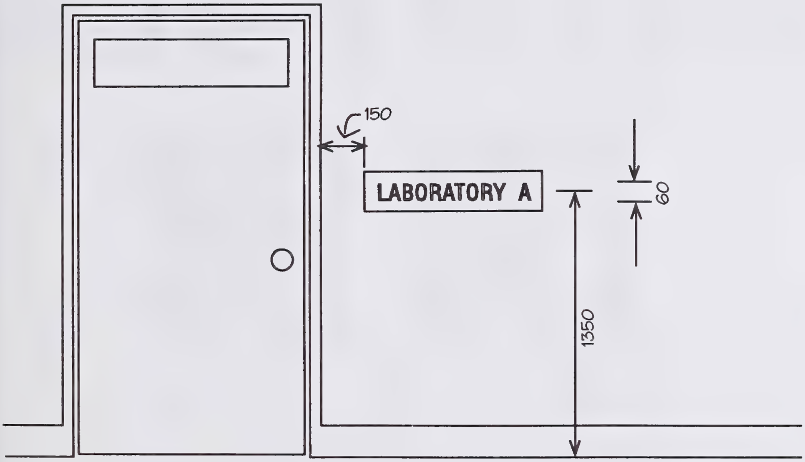
Signage

3.7.3.1. Accessibility Signs

(1) Where a *building* is required to have an entrance to accommodate disabled persons, signs incorporating the international symbol of accessibility for disabled persons shall be installed where necessary to indicate the location of that entrance.

(2) Where a washroom, elevator or parking area is required to accommodate disabled persons, it shall be identified by a sign consisting of the international symbol of accessibility for disabled persons and such other graphic or written directions as are needed to indicate clearly the type of facility available.





(3) Where a washroom is not designed to accommodate disabled persons in a *storey* to which a *barrier-free* path of travel is required, signs shall be provided to indicate the location of *barrier-free* facilities.

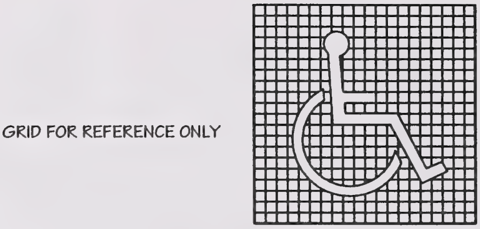
(4) Where special equipment is provided for disabled persons, such as special door opening controls, variable volume controls on telephones, or telecommunication devices for the deaf (TDD), they shall be identified by an appropriate symbol and provided with instructions for their use.

(5) Doors and openings that lead from public places and through which the public is permitted to enter shall be identified by specific tactile signs with letters
   (a) not less than 60mm high and raised 0.75mm above the surface, and
   (b) located 1350mm above the floor surface and beginning not more than 150mm from the door openings.

(See also 3.4.6.17.(1).)

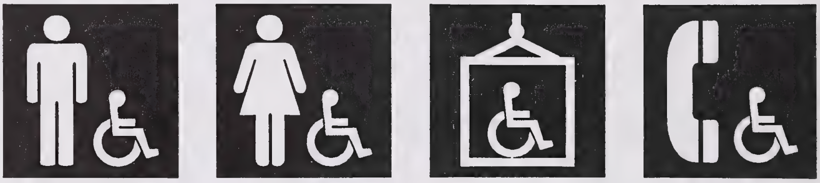
The International Symbol

The international symbol indicates that persons with disabilities will have reasonable freedom of movement within a building so signed. The symbol is usually white on a blue background. Where the colours do not stand out, the symbol can be in blue set on a white background. Other contrasting colours may be used; however, they should be avoided if possible. An arrow can be added to indicate direction or the location of an accessible space or facility.



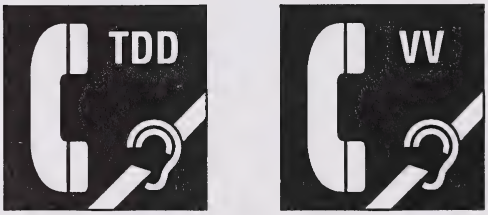
Accessibility for Persons in a Wheelchair

The international symbol, in conjunction with a facility symbol and an arrow, points the way to a facility that can be specifically used by a person in a wheelchair.



Accessibility for Persons with Hearing Impairments

Where facilities are specifically provided for persons with hearing impairments, the symbolic ear with the beginnings of a line through it is used.



Accessibility for Persons whose vision is impaired

The figure with an outstretched cane identifies specific facilities for persons with visual impairments; such as the location of prerecorded instructions on how to use a voice guidance system or tactile messages as a person moves through the building.

Persons with visual disabilities rely on:

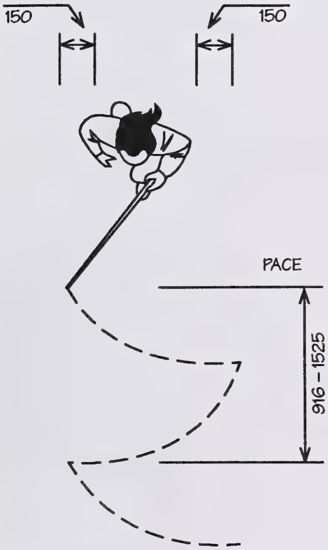
Lighting
- the intensity and distribution of lighting are used to accent areas and passageways,

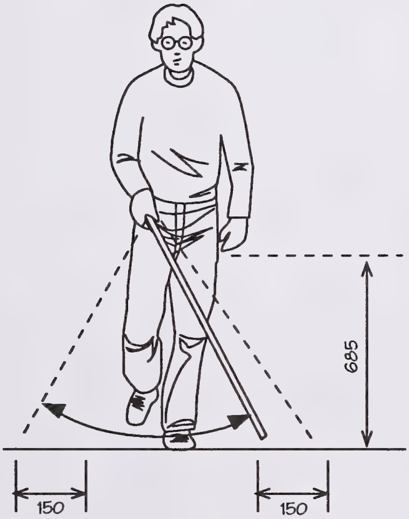
Audible Queues
- subtle sounds such as a fountain, clock, music, machine or verbal announcements help with orientation,

Tactile Queues
- different types of flooring can mark pathways, or changes from one area to another serve as a warning that a downward change in direction is to take place,

Colour/Contrast Queues
- colour and contrast can effectively be used to define the location of doorways, building controls such as light switches, thermostats and protruding elements such as handrails, fire extinguishers, etc., and

Ergonomics
- the design of rooms and the arrangement of furnishings that would allow people to move efficiently and safely along pathways within rooms and from room to room throughout the building.





Accessibility for Persons with Mental Disabilities

Wording used on a sign should be concise. Directional guidance should be restricted to one instruction per sign to avoid confusion. Directional symbols, such as arrows, should be clear and sharp and should not be highly stylized.

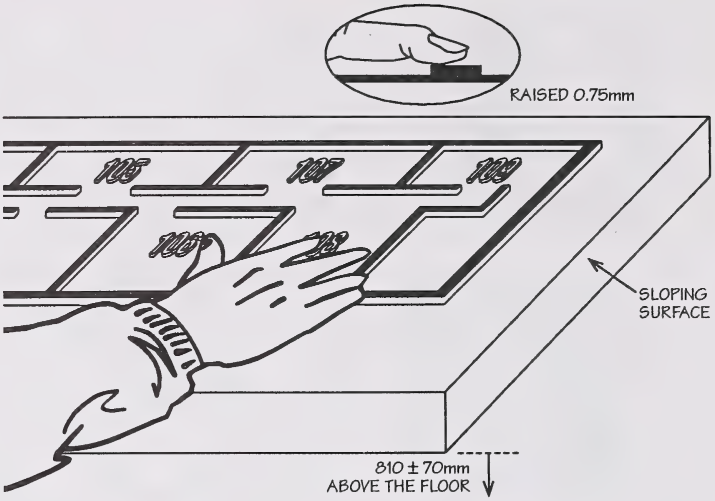
Standard symbols should be used to identify washrooms and to identify the sex for which they were designed. Coined terms such as "senor/senorita" or "pointer/setter" should not be used. These terms can be confusing to some people.

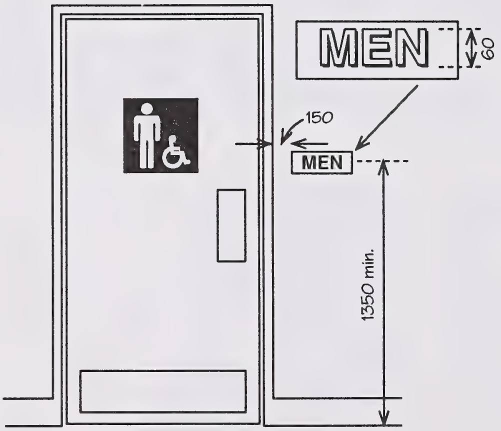
Directories

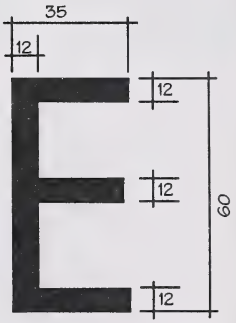
Building directories should be conveniently located, tactile in nature and located on a sloping plane 760 to 900mm above the floor. Characters that are raised at least 0.75mm are needed.

Persons who are blind can be given directions by the use of prerecorded messages or the use of tactile maps and signage. Guide dogs and canes are also used.

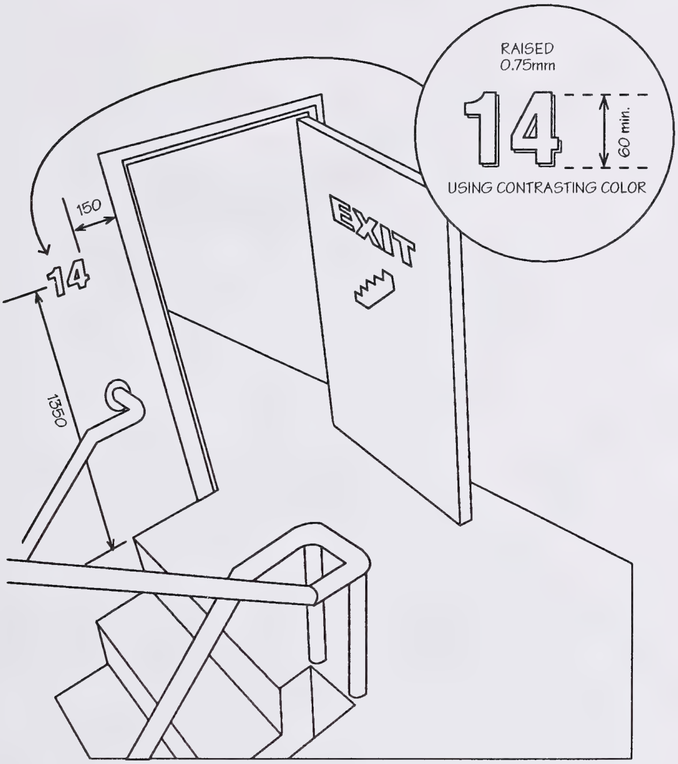
Visually impaired persons rely on cues such as colour contrast/brightness, changes in illumination, the use of standard architectural features, patterns and placement of elements.







CHARACTERS ON SIGNAGE RAISED .75mm



Floor Numbering

3.4.6.17. Floor Numbering

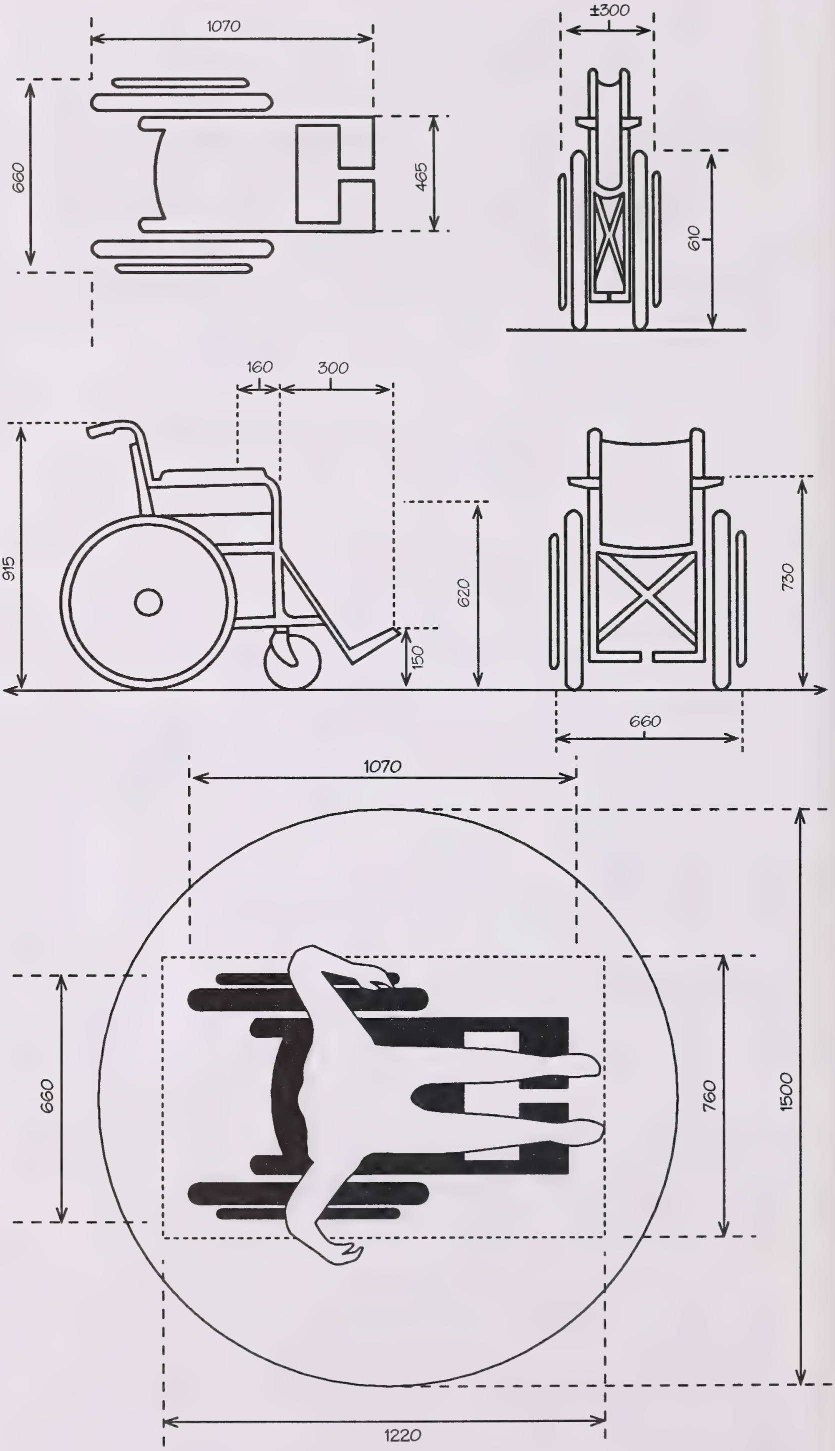
(1) Arabic numerals indicating the assigned floor number shall
  (a) be mounted permanently on the stair side of the wall at the latch side of doors to *exit* stair shafts,
  (b) be not less than 60mm high, raised approximately 0.75mm above the surface,
  (c) be located 1350mm from the finished floor and beginning not more than 150mm from the door, and
  (d) be contrasting in colour with the surface on which they are applied.

Colour Contrast
The identification of floors and other signs intended to help orient persons who are visually-impaired should offer maximum colour contrast to be effective. For this reason, it is recommended that white on black or black on white be used, as this combination produces the best legibility. It is also recommended that sign surfaces be processed to prevent glare. Assigned floor numbers should have a glare-free surface and be mounted on a background in contrasting colour.

VI. GENERAL INFORMATION AND RESIDENTIAL REQUIREMENTS

Wheelchairs

A person in a wheelchair occupies a space 760 x 1220mm and can turn within a 1500mm diameter circle.



Reaching Abilities from Wheelchairs

Reaching ability for a small person (1600mm in height)

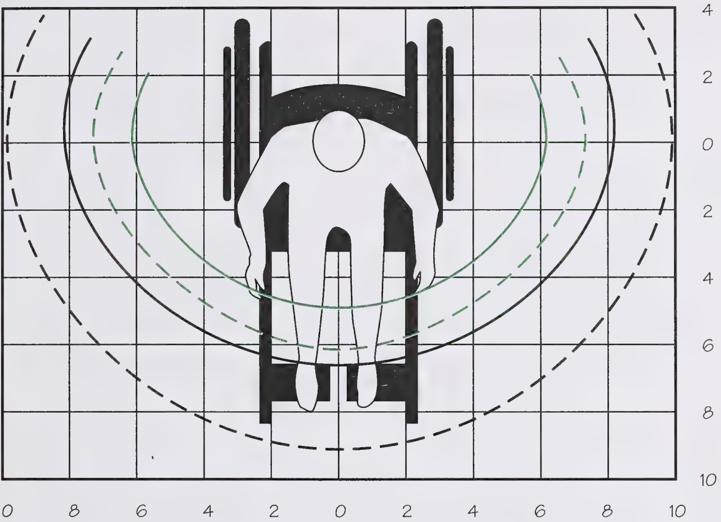
with good upper body movement – – – – – – –

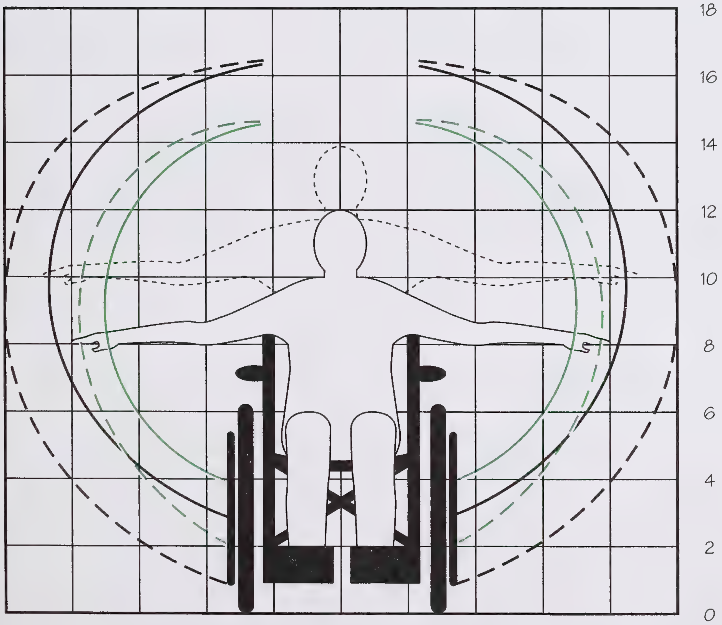
with some upper body movement ————————

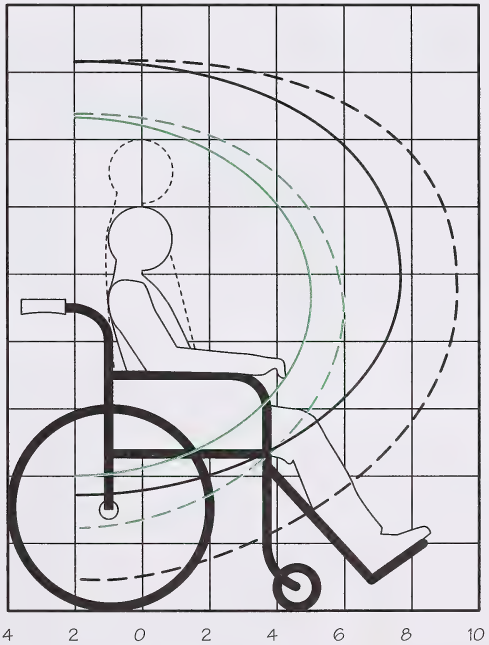
Reaching ability for an average person (1740mm in height)

with good upper body movement – – – – – – – –

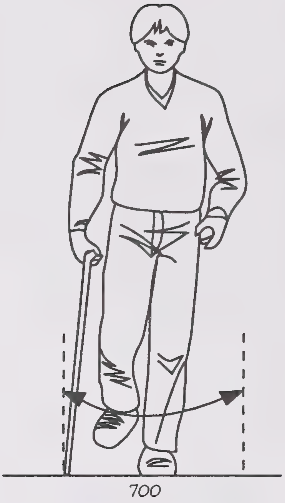
with some upper body movement ————————



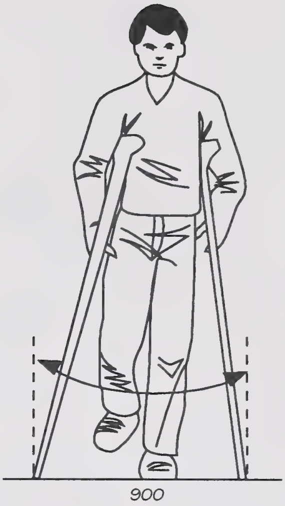




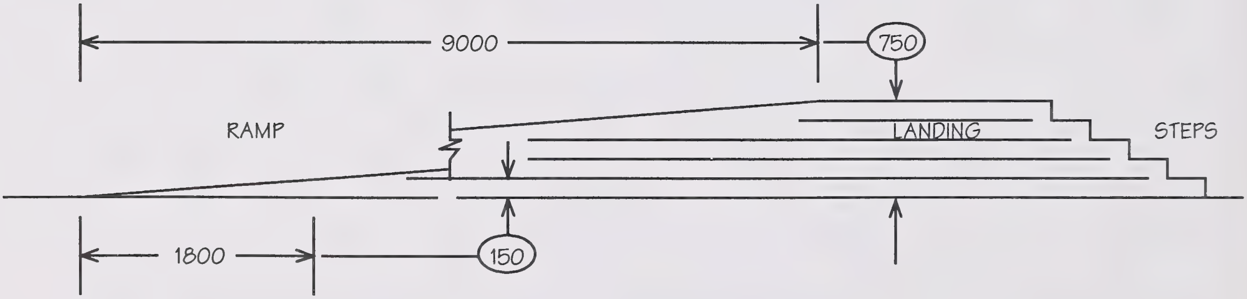
Person Using a Cane or Crutches



PERSON USING A CANE



PERSON ON CRUTCHES



PRACTICAL LIMITS FOR RAMPS	
LENGTH	RISE
1000	83
1800	150
2000	166
3000	250
3600	300
4000	333
5000	416
5400	450
6000	500
7000	583
7200	600
8000	666
9000	750

Residential Design

The Alberta Building Code deals primarily with public buildings setting standards for a wide range of abilities. Barrier-free design for residential application are most often personalized in accordance with ones limitations and lifestyle. Over time, special features are designed and modified on site in a process of trial and error as determined by what an individual can and has learned to do. In existing homes, accessibility can often be accomplished with few changes. Some solutions are acceptable on a residential scale and may involve some minor inconveniences. Many barrier-free homes must be designed and built to accommodate specific disabilities or special conditions and for these reasons, building codes do not adequately define residential requirements.

Entrances

In the residential design of entrances, stairs present the single greatest barrier. Two ways around this obstacle are the use of ramps or lifts. When to choose one over the other? First consider the length of the ramp needed to rise the required distance. The length of a ramp should not exceed 9m without a landing. A ramp of 9m in length will provide a lift of 750mm. It would be reasonable to look at a rise of 750mm for ramping and the use of a lift for rises over that.

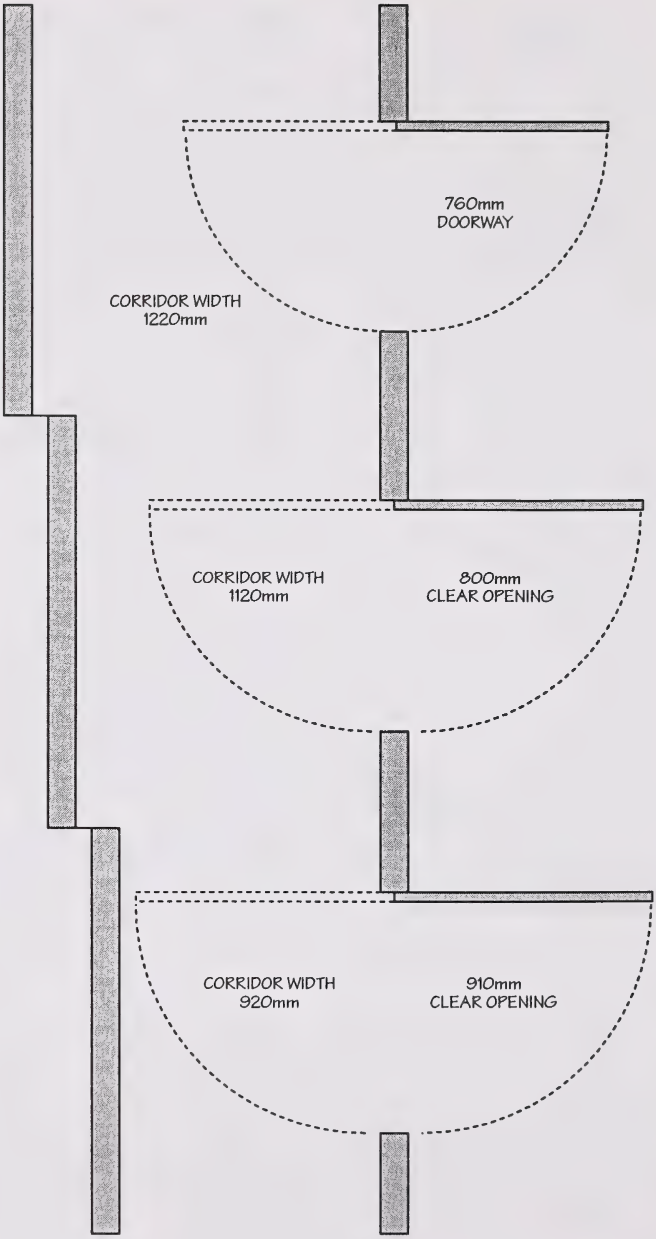
For a person in a wheelchair, a door security viewer located 1150 ± 50mm from the floor should be provided when possible as an added security feature for the front entry.

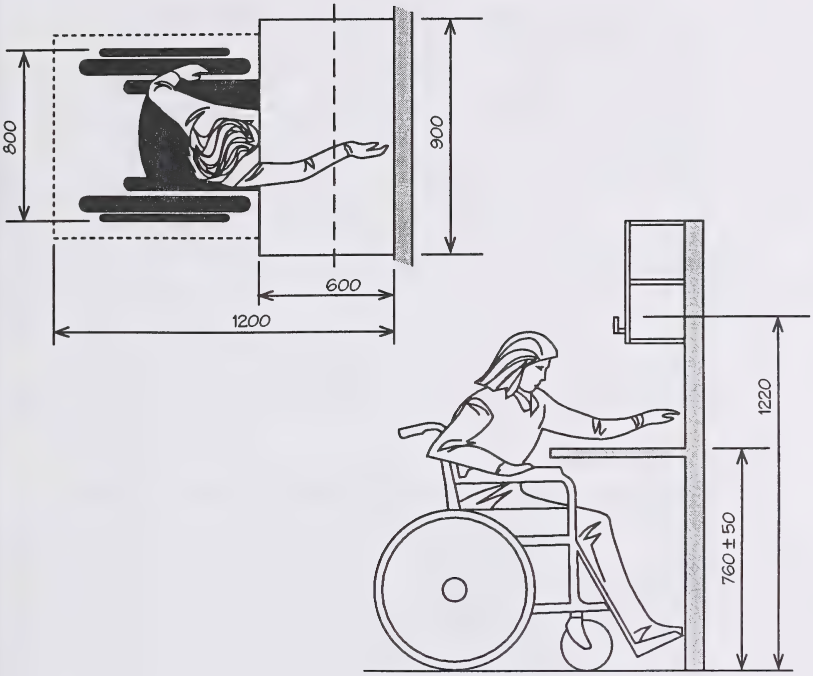
Doors and Hallways

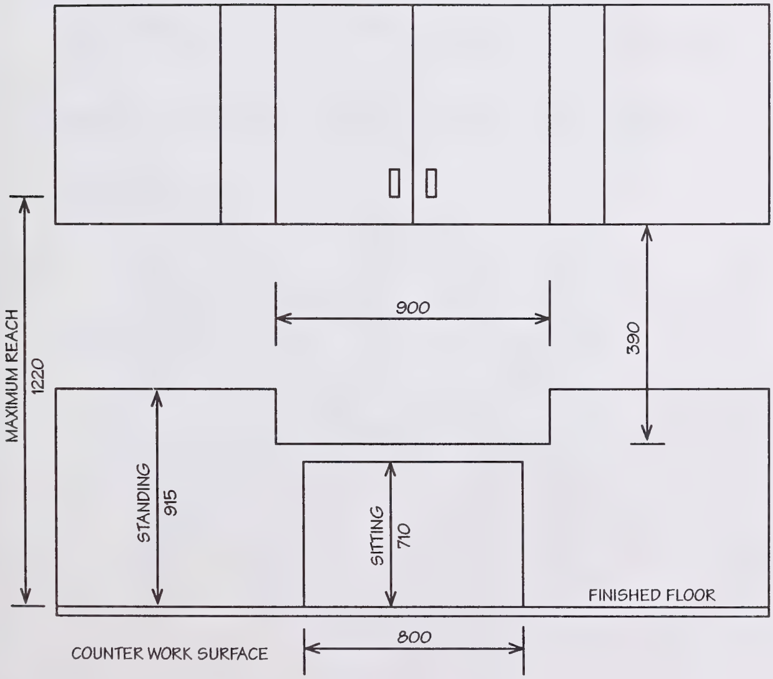
The relationship of a hallway to a doorway is most critical. While Residential Building Codes allow the use of narrow hallways, a minimum width of 920mm is needed for the movement of a wheelchair especially when turning a 90° corner. Doorways are required to be 800mm wide but 900mm is preferred. The Code allows a 760mm doorway to be used on washrooms, however the ability to turn into such a doorway is constrained by the width of the corridor. In order to turn into a 760mm doorway, the width of the corridor must be at least 1220mm.

The use of lever handles are preferred on doors that latch. Pocket doors are at times difficult to pull or push into the closed or open position.

Residential washrooms are normally too small to allow a door to swing inwards and therefore doors to such washrooms must swing out, usually into a corridor. Doors which swing out from a room are potentially hazardous, especially for persons with limited vision.







Kitchens

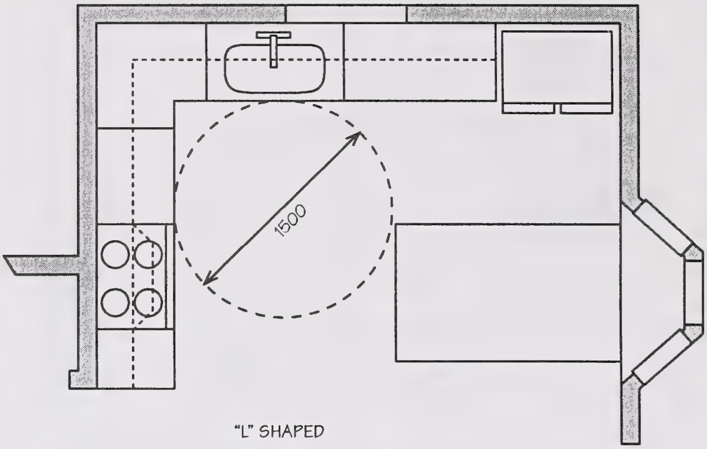
A number of simple modifications can be made to traditional kitchen designs which will increase accessibility, especially to those in wheelchairs. The difficulty lies in trying to balance the needs of persons working in a standing position where the counter height is 915mm and sitting position where the height is 760mm. The ultimate flexibility is achieved when cabinets, counters and appliances can be rearranged — that is plugged in wherever one wants them and lifted or lowered automatically. Simply lowering the cabinets both upper and lower leaving 400mm between them makes a substantial difference.

An open floor space 1500mm wide provides the second key design element. This allows turning and passing room and is appreciated especially within the kitchen area itself. Pull-out work counters allow extra work area (usually at a height which is a little lower than counter height) and provides knee-space below. Roll out drawers make it easier to reach things that are normally at the back. At least one 900mm section of counter should be provided as a work surface for someone standing if the counters are predominantly sized for persons working in a sitting position and vice versa. Ideally the counter should be adjustable for variable heights between 710mm and 915mm.

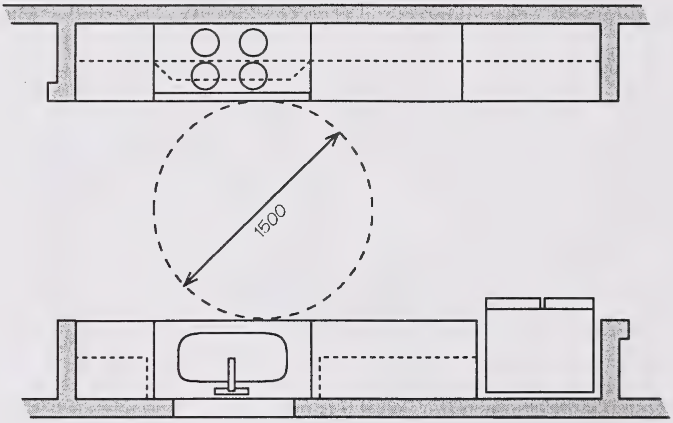
Suggested Kitchen Layouts

Kitchen storage within the reach of a sitting person is usually limited by space; thus forcing individuals to plan and limit the number of kitchen appliances and utensils kept on hand. Pull-out drawers, carts, caddies, pantry shelves, etc. . . . reduce the necessity to reach and makes it easier to find items. Where drawers pull out parallel to a wheelchair, it makes the reach simpler. Reaching ability will differ from one person to another. As a general rule, a reachable shelf should not be more than 1200mm above the floor and "D" shaped cabinet door handles not more than 25mm higher. When toe space is provided, the base cabinets are recessed 200mm for a height of 250mm.

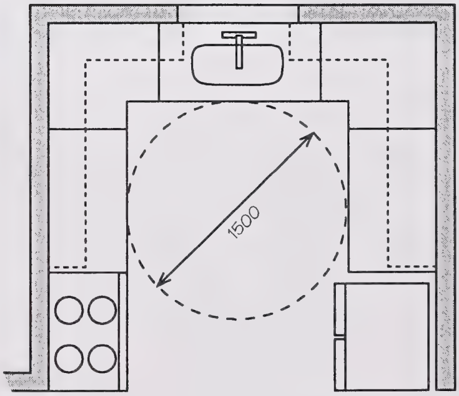
Kitchen counters including sinks should have the flexibility of being automatically or manually adjustable for heights between 710mm and 915mm above the floor. Where the sink has been lowered and knee space provided, a shallow 165mm sink might be used. A clear depth of 485mm and width of 800mm should be maintained for knee space below the sink. Hot-water pipes and drain pipes under the sinks should be insulated or otherwise covered to help prevent the possibility of burns.



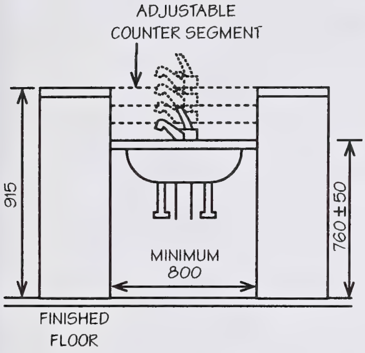
"L" SHAPED

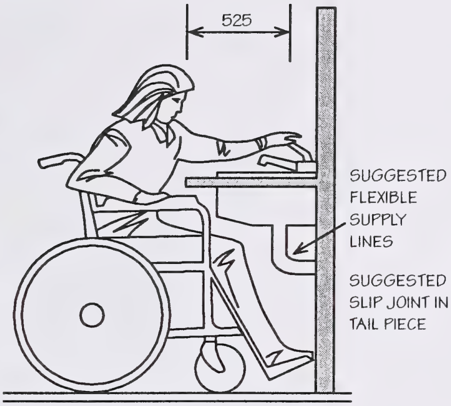


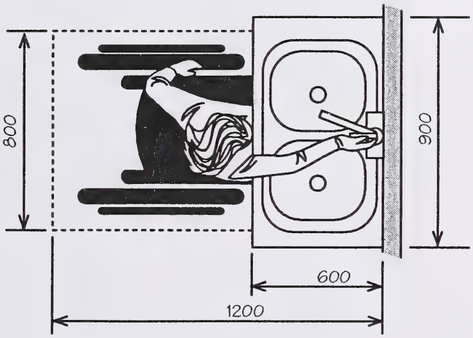
GALLEY

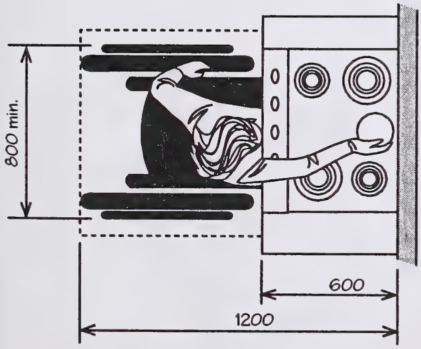


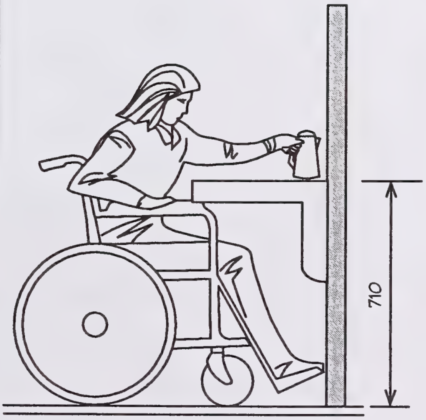
"U" SHAPED




525
SUGGESTED FLEXIBLE SUPPLY LINES
SUGGESTED SLIP JOINT IN TAIL PIECE







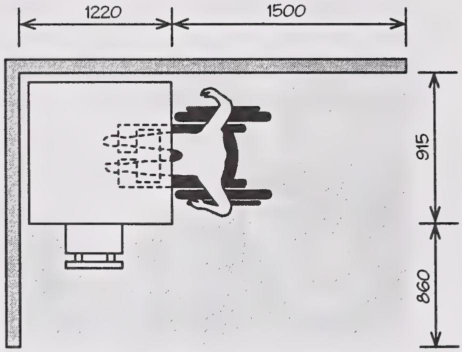
Appliances can make life easier. Certain appliances are better suited to some persons with specific disabilities than to others. For instance, counter top cooking elements set 710mm above the floor with knee space below can allow some persons in wheelchairs to reach the back burner. Self cleaning ovens are easier to clean. Controls must be within reach. For ovens with vertically hinged doors, a pull-out work surface is recommended. The pull-out work surface should provide a work space at least 255mm deep and 800mm wide.

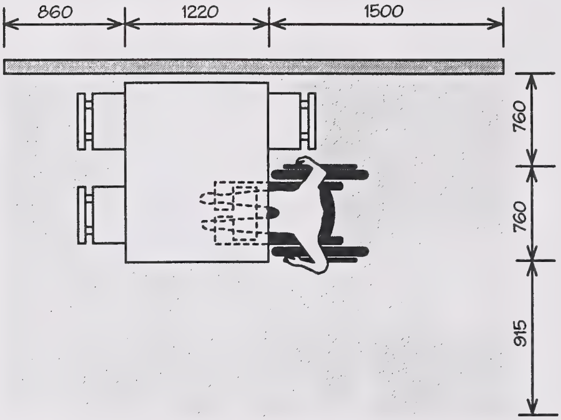
Built-in dishwashers are normally front loading and designed to fit under a counter; however, they can be elevated and fitted into a cabinet.

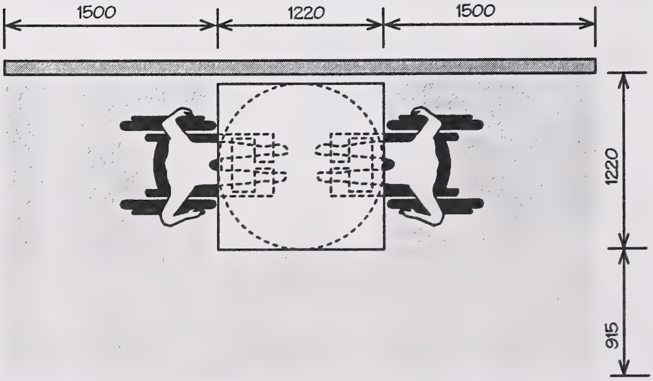
A garbage compactor, though regarded by many as a luxury item, is a step saver to a person who is disabled.

A side by side refrigerator/freezer offers storage space within reach of a person standing or sitting. However, shelving in these units tend to be narrow and deep causing problems in reaching for things at the back. A separate upright freezer offers greater convenience. Refrigerators designed with the freezer compartment on the bottom offer other desirable features.

Suggested Dining Room Layouts

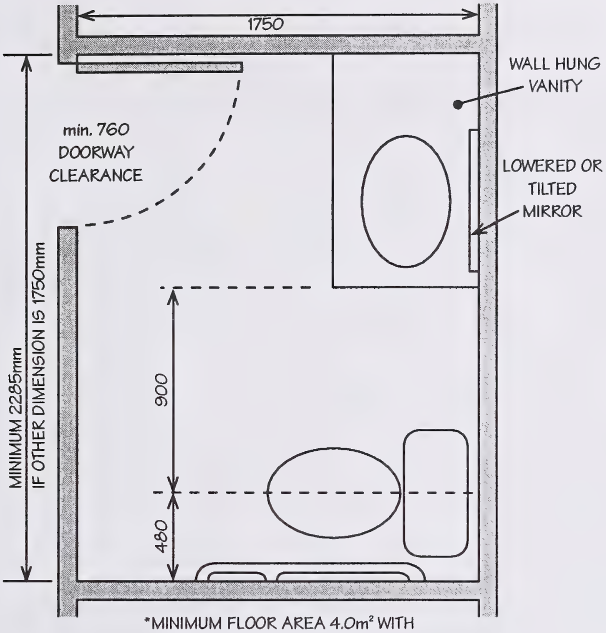




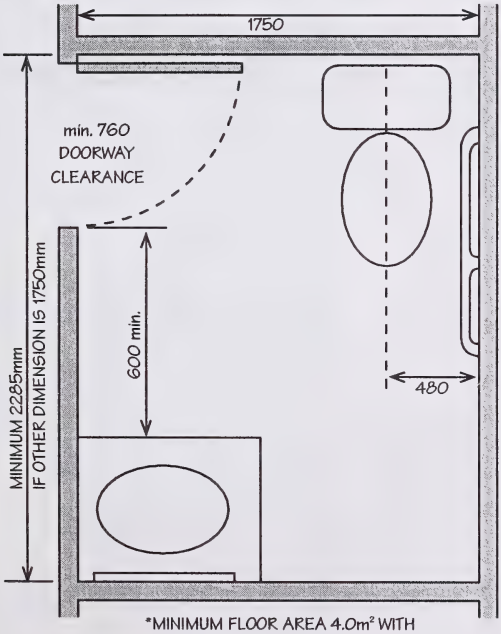


Suggested Washroom Layouts

There are a number of different configurations that are considered satisfactory. First let us consider the two piece washroom layouts, then, examples of three piece washroom layouts.

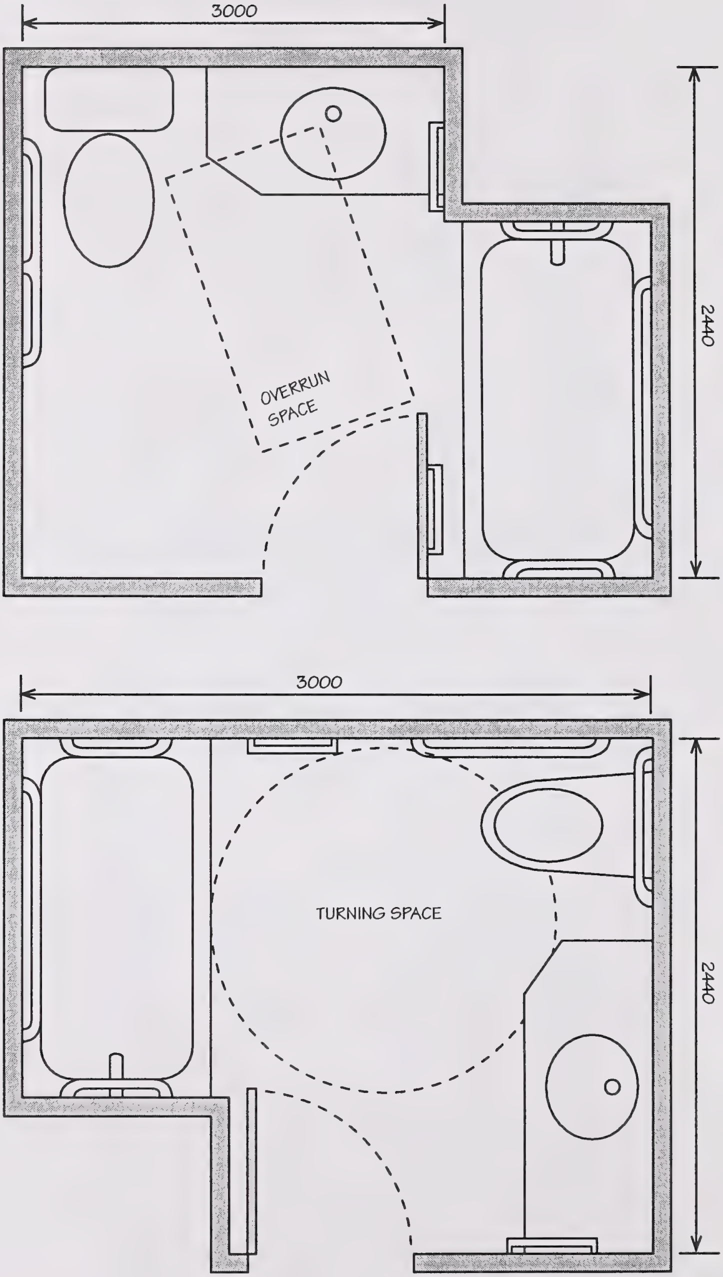

1750
WALL HUNG VANITY
LOWERED OR TILTED MIRROR
min. 760 DOORWAY CLEARANCE
MINIMUM 2285mm IF OTHER DIMENSION IS 1750mm
900
480

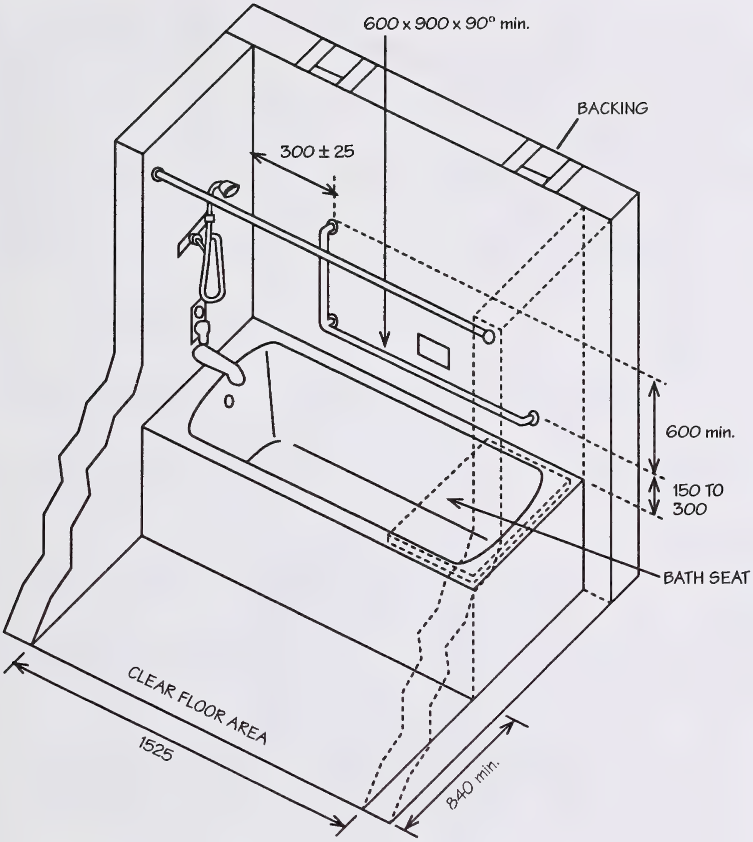
*MINIMUM FLOOR AREA 4.0m² WITH NO DIMENSION LESS THAN 1750mm


1750
min. 760 DOORWAY CLEARANCE
MINIMUM 2285mm IF OTHER DIMENSION IS 1750mm
600 min.
480

*MINIMUM FLOOR AREA 4.0m² WITH NO DIMENSION LESS THAN 1750mm

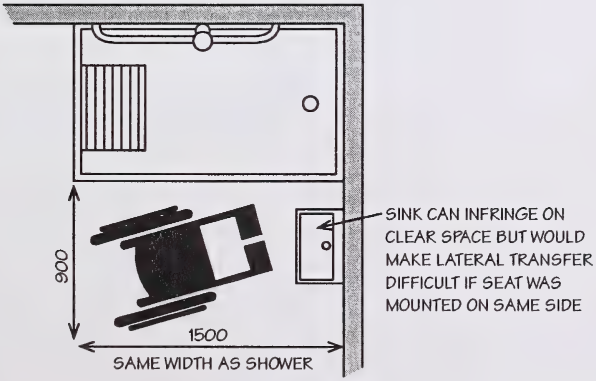
Examples of three piece washroom layouts





Bathtubs

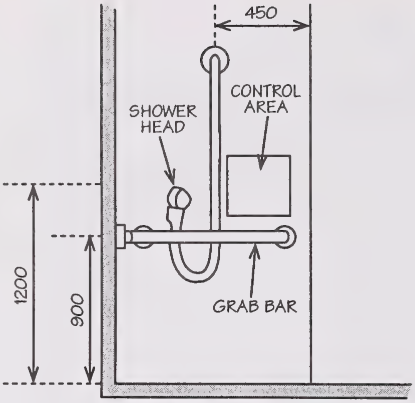
Traditional bathtubs can easily be equipped with grab bars if the proper backing was installed at the time of initial construction. Space is required to maneuver a wheelchair close to the bathtub. An area approximately 840 x 1525mm is needed when approaching a bathtub perpendicularly, and 760 x 1220mm when approaching parallel to the bathtub. At times, tubs are raised 100mm or so to have the edge of the tub at the same height as that of a wheelchair seat. Often the bathtub is provided with a seat for the elderly who have difficulty getting up from a bathing position. In this instance, a hand held shower head is used.


SINK CAN INFRINGE ON CLEAR SPACE BUT WOULD MAKE LATERAL TRANSFER DIFFICULT IF SEAT WAS MOUNTED ON SAME SIDE
900
1500
SAME WIDTH AS SHOWER

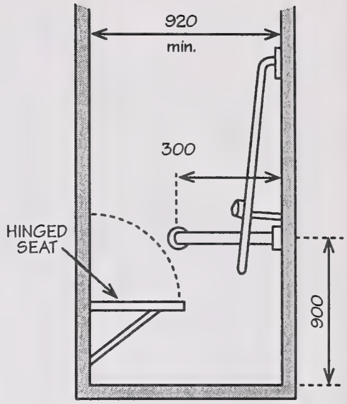
Showers

For assembly type buildings where showers are provided, a shower stall large enough to accommodate a wheelchair is required.

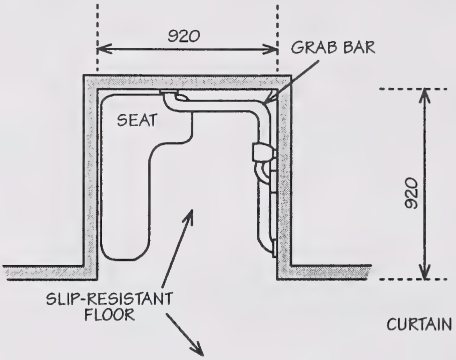
Residential showers not used by persons in wheelchairs tend to be smaller and usually incorporate a seat. Designed specifically for use by a person in wheelchair a shower 900 x 1500mm would be required.



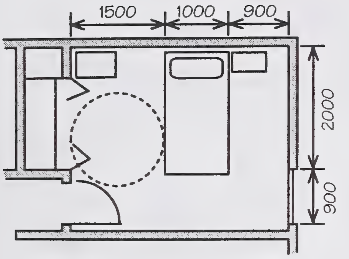
SIDE ELEVATION

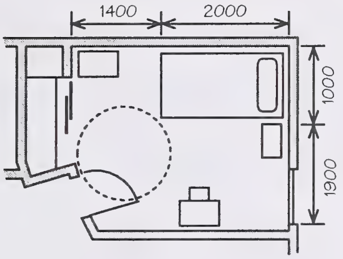


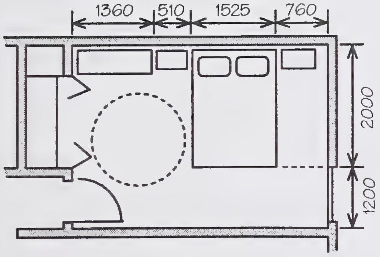
BACK ELEVATION

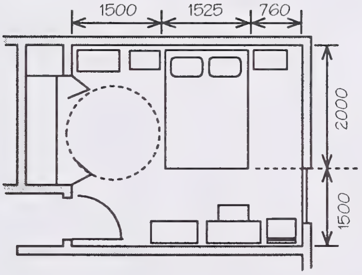


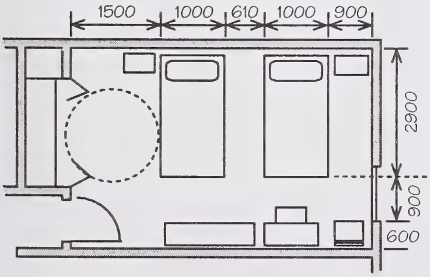
Suggested Bedroom Layouts

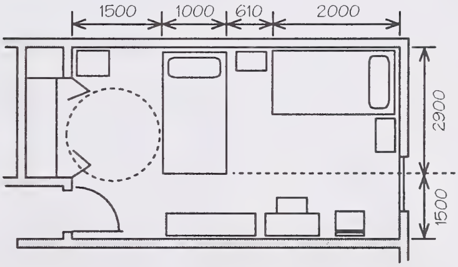




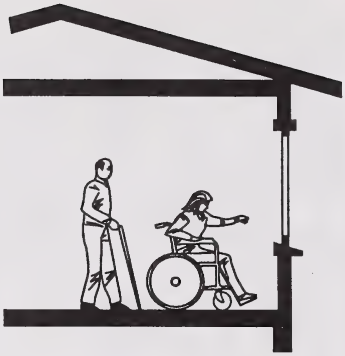








Windows



To enable wheelchair users to see through a window comfortably, the sill should not be higher than 800mm from the floor. Windows should be easy to open and close and their controls should be placed in an area 800mm to 1200mm from the floor.

In residential design, many details must be personalized. The Easter Seal Ability Council has put together a resource center to help individuals find solutions to their particular needs. For additional information and assistance contact the

Easter Seal Ability Council's Resource Center
#216 HYS CENTER
11010 – 101 Street
Edmonton, Alberta T5H 4B9
phone 429-0137
fax 429-2065
TDD 429-2065

Another organization that could be contacted is:

The Handicapped Housing Society of Alberta
600 – 9919 105 Street
Edmonton, Alberta T5K 1B1
phone 428-3303
fax 425-6880

CONVERSION FACTORS

TO CONVERT	TO	MULTIPLY BY
°C	°F	1.8 and add 32
kg	lb	2.205
kPa	lbf/in^2(psi)	0.1450
kPa	lbf/ft^2	20.88
L	gal (imp.)	0.2200
L/s	gal/min (gpm)	13.20
lx	ft-candle	0.09290
m	ft	3.281
m^2	ft^2	10.76
m^3	ft^3	35.31
mm	in.	0.03937
m^3/h	ft^3/min (cfm)	0.5886
m/s	ft/min	196.8
MJ	Btu	947.8
N	lbf	0.2248
ng/Pa • sm^2	perms	0.0174
Pa	Inches of water	0.004014
W	Btu/h	3.412

APPENDIX

Code References		Page Number
3.2.4.18.	**Alert and Alarm Signals**	
	Sentence (5)	53
3.2.4.19.	**Audibility of Alarm Systems**	
	Sentence (1)	53
	Sentence (2)	53
3.2.4.20.	**Visual Signals**	
	Sentence (1)	53
	Sentence (2)	53
	Sentence (3)	53
3.3.1.7.	**Protection on Floor Areas with a Barrier-Free Path of Travel**	
	Sentence (1)	14
	Sentence (2)	55
3.3.1.8.	**Headroom Clearance (Access to exit)**	27
3.3.1.9.	**Corridors**	
	Sentence (1)	26
	Sentence (2)	26
	Sentence (3)	26
	Sentence (4)	26
3.4.3.7.	**Headroom Clearance (Exits)**	
	Sentence (1)	27
	Sentence (2)	27
	Sentence (3)	27
	Sentence (4)	27
3.4.6.1.	**Slip Resistance of Stairs and Ramps**	
	Sentence (1)	27
	Sentence (2)	27
3.4.6.2.	**Minimum Number of Risers**	28
3.4.6.3.	**Landings and Maximum Vertical Rise of Stair Flights**	
	Sentence (2)	31
	Sentence (3)	31
	Sentence (4)	31
3.4.6.4.	**Handrails**	
	Sentence (1)	29
	Sentence (2)	29
	Sentence (3)	29
	Sentence (4)	29
	Sentence (5)	30
	Sentence (6)	30
	Sentence (7)	30
	Sentence (8)	30
3.4.6.5.	**Guards**	
	Sentence (1)	31
	Sentence (2)	31
	Sentence (3)	31
	Sentence (4)	31
	Sentence (5)	31
	Sentence (6)	32
3.4.6.6.	**Ramp Gradients**	
	Sentence (1)	22

3.4.6.7. **Stair Treads and Risers**
Sentence (1) 28
Sentence (2) 28
Sentence (3) 28
Sentence (4) 28
Sentence (5) 28

3.4.6.17. **Floor Numbering**
Sentence (1) 63

3.7.1.1. **Applications**
Sentence (1) 7
Sentence (2) 8
Sentence (3) 8
Sentence (4) 9

3.7.1.2. **Entrances**
Sentence (1) 9
Sentence (2) 10
Sentence (3) 54

3.7.1.3. **Barrier-Free Path of Travel**
Sentence (1) 11
Sentence (2) 11
Sentence (3) 11

3.7.1.4. **Stories Served by Escalators** 12

3.7.1.5. **Controls** 52

3.7.2.1. **Areas Requiring Barrier-Free Access**
Sentence (1) 12
Sentence (2) 13
Sentence (3) 13
Sentence (4) 16

3.7.2.2. **Seating** 50

3.7.2.3. **Washrooms Required to be Barrier-Free**
Sentence (1) 38
Sentence (2) 38
Sentence (3) 38
Sentence (4) 38
Sentence (5) 38

3.7.2.4. **Parking**
Sentence (1) 16
Sentence (2) 16
Sentence (3) 16

3.7.2.3. **Accessibility Signs**
Sentence (1) 58
Sentence (2) 58
Sentence (3) 59
Sentence (4) 59
Sentence (5) 59

3.7.3.2. **Exterior Walks**
Sentence (1) 19

3.7.3.3. **Doorways and Doors**
Sentence (1) 23
Sentence (2) 23
Sentence (3) 23
Sentence (4) 23
Sentence (5) 24

Sentence (6) 24
Sentence (7) 24
Sentence (8) 25
Sentence (9) 25
Sentence (10) 25
Sentence (11) 26

3.7.3.4. **Ramps**
Sentence (1) 20
Sentence (2) 22
Sentence (3) 22

3.7.3.5. **Elevators**
Sentence (1) 32
Sentence (2) 37
Sentence (3) 32

3.7.3.6. **Spaces in Seating Area**
Sentence (1) 51

3.7.3.7. **Assistive Listening Devices**
Sentence (1) 57
Sentence (2) 57

3.7.3.8. **Water Closet Stalls**
Sentence (1) 42
Sentence (2) 43
Sentence (3) 43

3.7.3.9. **Water Closets and Urinals**
Sentence (1) 45
Sentence (2) 45

3.7.3.10. **Lavatories**
Sentence (1) 46
Sentence (2) 46
Sentence (3) 46
Sentence (4) 46

3.7.3.11. **Special Washrooms**
Sentence (1) 40

3.7.3.12. **Showers**
Sentence (1) 47

3.7.3.13. **Counters**
Sentence (1) 49
Sentence (2) 49
Sentence (3) 49

3.7.3.14. **Shelves, Counters and Telephone Equipment**
Sentence (1) 56
Sentence (2) 56
Sentence (3) 56
Sentence (4) 56
Sentence (5) 56

3.7.3.15. **Drinking Fountains**
Sentence (1) 50

9.8.7.2. **Continuous Handrail** 30

9.8.7.3. **Termination of Handrails** 30

9.8.7.4. **Handrail Extension** 31

N.L.C./B.N.C.
3 3286 50151 1105